OCTOBER 1, 1960

Chemical Week

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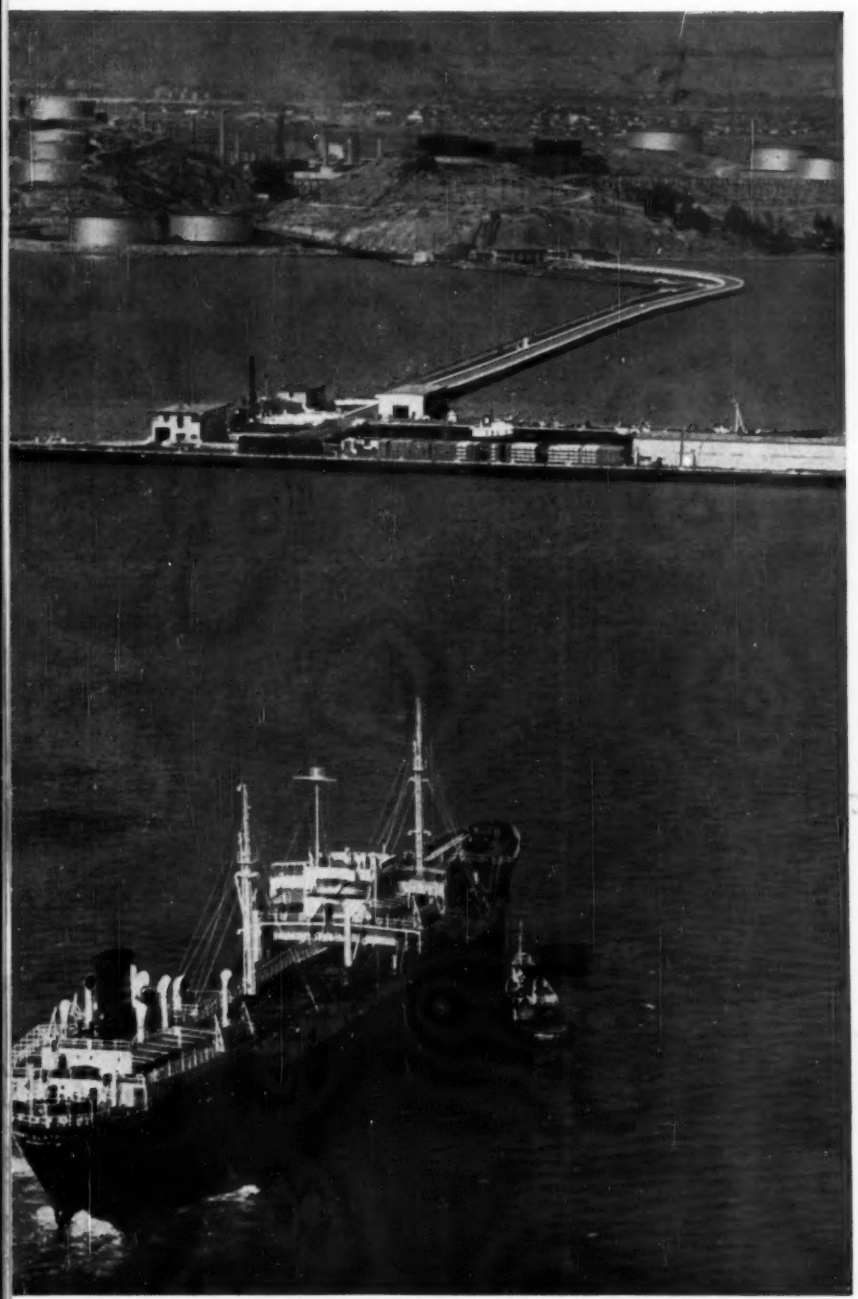

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Sizing up salesmen. Here's how CPI gauges sales staff effort . . . p. 83

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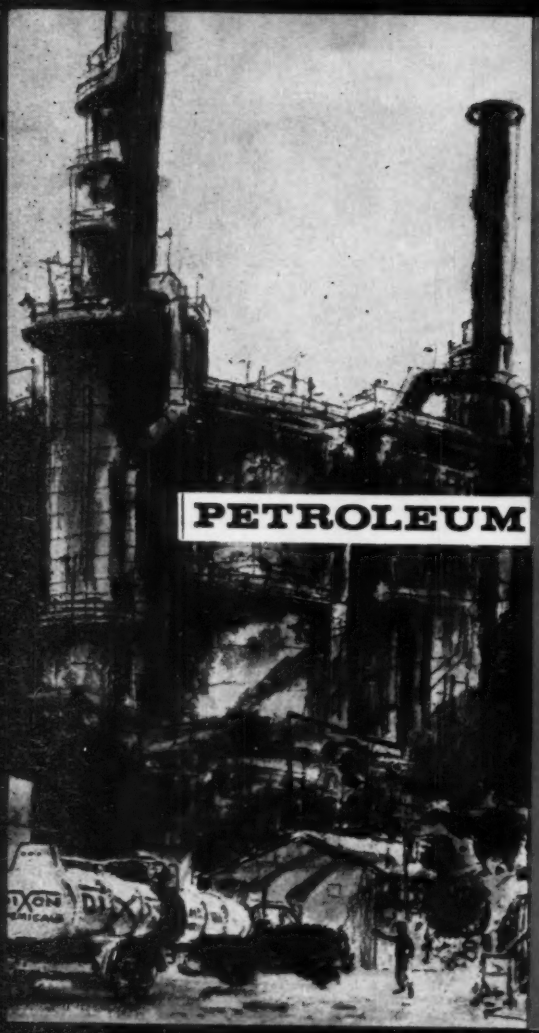

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ON THE COVER: Tanker steams toward the regionally famous "Long Wharf" of Standard Oil Co. of California, in San Francisco's fast-growing East Bay district.

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Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw - Hill Publishing Co., James H. McGraw (1860-1948), founder. EXECUTIVE, EDITORIAL, CIRCULATION AND ADVERTISING OFFICES: McGraw-Hill Building, 330 West 42nd St., New York 36, N. Y. Telephone, LO 4-3000; Teletype, TWX N.Y. 1-1636; Cable, McGRAWHILL, N. Y. Place of publication: Philadelphia, Pa. Second class postage paid at Philadelphia. (See below for directions regarding subscriptions or change of address.) OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, president; Shelton Fisher, Wallace F. Traendly, senior vice-presidents; John R. Callaham, vice-president and editorial director; Joseph H. Allen, vice-president and director of advertising sales; A. R. Venezian, vice-president and circulation coordinator. OFFICERS OF THE CORPORATION: Donald C. McGraw, president; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, executive vice-presidents; L. Keith Goodrich, vice-president and treasurer; John J. Cooke, secretary.

United States and United States possessions subscription rate for individuals in the field of the publication, $3 per year; single copies, 50¢. Foreign subscription rates per year: Canada, $4; other Western Hemisphere countries, $15; all others, $25, payable in advance. Printed in U.S.A. Title registered in U.S. Patent Office.
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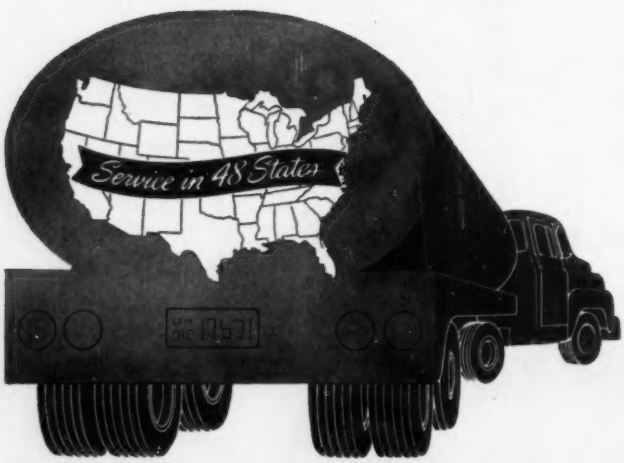

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Cooperation, Not Coordination

IN THE FIELD OF PROPELLANTS for rockets and missiles, the chemical industry has been caught in an unenviable position.

To illustrate: Two years ago CHEMICAL WEEK interviewed a highly respected authority on rockets. The gist of the questioning: What could the chemical industry do in the field that it was not then doing? The gist of his answer: Nothing. He reasoned that the chemical industry simply was not set up to function efficiently to meet the needs of a small-volume, high-purity test program.

"A chemical engineer," he said, "is a hero if he can make a product for a cent a pound cheaper than his competitor. He doesn't realize we're willing to pay a dollar a pound more to get the purity that we need."

What was his solution? Rocket companies were hiring their own chemists and engineers to find promising compounds. When they needed a quantity for evaluation, they'd make it themselves.

The other day, *CW* questioned a rocket scientist on the same subject. He had some biting remarks. He said the solid-propellant program was now at a plateau. Just about all the available chemical combinations have been tried and the rocket engine developers are being held back by a lack of new ones. The chemical industry, he concluded, had started too late.

His anger was not directed at the chemical industry but at the government supervision that had permitted it. But the irony of the situation is that the same man was interviewed both times.

Such inconsistencies probably should be expected in a program so big, so complex and so new. By the same token, it's clear that much of the difficulty stems from petty differences, pet projects by the different services and an unwillingness to acknowledge the possibility of contributions from others.

A new board (*CW Washington Newsletter, Sept. 24*) has been set up to coordinate the space program between the National Aeronautics and Space Administration and the Dept. of Defense. Officially known as the Aeronautics and Astronautics Coordinating Board, the new body has Herbert F. York, Dept. of Defense's director of research and engineering, and Hugh L. Dryden, deputy administrator of NASA as cochairmen. It will exchange and coordinate planning information, exchange information on current projects, resolve any conflicts that arise in these areas and be a general clearing house for space information. The main differences between this and previous efforts is that the new board will have at its disposal the key decision-makers in all important areas.

Unfortunately the board has not, it appears, started off on the right foot. It has already held two meetings (the first on June 1), but it has not been "formalized" by Space Administrator T. Keith Glennan and Secy. of Defense James Douglas. Officials say this is expected shortly. They will not explain why revelation of the new board was made on Sept. 13—three months after its first meeting and before it has been officially accepted.

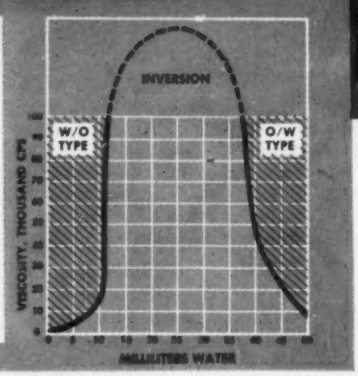
In any case the creation fills a long-felt need. In the last analysis, however, coordination is not needed so much as is cooperation—the willingness to subjugate private prejudice for the common good.

Dow **C.P.I.** *file* **1**

EMULSIFICATION

PRIMARY CONSIDERATIONS in the choice of emulsification materials are compatibility of the components, viscosity, stability, particle size, and toxicity. On the next page are shown the properties of methylcellulose, a highly effective, safe emulsifier. Described below is a formulating technique with Dow alkanolamines contributing to higher viscosity, smaller particle size, and thus greater stability.

INVERSION, the technique by which the oil and water phases of an emulsion change relationships, is recommended for use in all methods of alkanolamine emulsion formulating when maximum stability is desired. Graph shows changeover of a triethanolamine emulsion. The fatty acid was dissolved in the oil and the TEA was dissolved in the resulting acid-oil solution. Then, with stirring, small increments of water were added. The graph is characteristic of all alkanolamines if the same procedure is followed.



INTERMEDIATES

ALKANOLAMINE SOAPS—NONCORROSIVE, STABLE, SAFE FOR SKIN AND TEXTILES

MOST IMPORTANT of the Dow alkanolamines, all water soluble, are monoethanolamine (MEA), triethanolamine (TEA), monoisopropanolamine (MIPA), and diisopropanolamine (DIPA). Compared to other amines in the alkanolamine series, these compounds produce emulsions having finer particle size and greater stability.

Being essentially neutral, emulsions prepared with alkanolamines are relatively noncorrosive to metals and are not harmful to the skin nor to textiles. Frequently a natural oil will contain enough organic acid so that in the presence of an alkanolamine it will emulsify readily in water. Alkanolamine-fatty acid emulsions are easily prepared from such common acids as oleic, stearic, and palmitic. End use will determine the acid used. For example, oleic acid yields low viscosity, stearic higher viscosity. Proven uses for alkanolamine soaps include metal cutting and buffing compounds; floor, furniture, and car polishes; pharmaceutical ointments, skin creams and lotions; insecticide sprays, textile scouring, and wetting agents.

For a comprehensive coverage of the Dow alkanolamines, write for the Dow booklet "Alkanolamine Soaps in Emulsions."

CHOICE OF FATTY ACID HAS STRONG EFFECT ON EMULSION VISCOSITY		CHOICE OF AMINE HAS LESS EFFECT ON EMULSION VISCOSITY	
FATTY ACID	VISCOSITY (cps) at 77°F.	AMINE	VISCOSITY (cps) at 77°F.
Oleic	240	DIPA	3.9
Palmitic	450	MIPA	8.0
Stearic	2,000	MEA	12.0
		TEA	230.0

Mineral oil and water dispersions in 1:1 fatty acid-alkanolamine mole ratio of components. Table 1 at left uses TEA as the amine, Table 2 at right uses oleic acid. Both systems contain approximately 80 parts water, 15 parts oil, and 7.5 parts total emulsifier.

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Methocel®, Dow methylcellulose, is an outstanding example of a synthetic methylcellulose gum that excels natural gums as a thickener and has valuable side properties as well. In addition to thickening, Methocel products are used as emulsifiers, emulsion stabilizers, suspending agents, and binders.

Methocel compounds are also unique in the class of gum compounds for their *surfactant* properties. Lowering the surface tension of water, Methocel is classed as a moderately active wetting agent. In many formulations Methocel acts as both thickener and surfactant.

ORGANIC COMPATIBILITY. One of the Methocel products—60 HG—differs from other synthetic or natural gums because of its solubility in both water and in organic solvents. High organic compatibility suggests its use for emulsifying a variety of aromatic and other organic materials. Another—Methocel 70 HG—has provided the answer to some of the problems encountered in the preparation of straight-chain hydrocarbon emulsions.

APPROVED FOR FOOD USE. Methocel products have been used as food additives for many years. Methocel MC, U.S.P., is generally recognized as safe for use in foods (*Federal Register*, 881, February 2, 1960). A food additive petition has been filed (No. 72) covering the use of the Methocel HG products in foods (*Federal Register*, 1690, February 26, 1960). Current use of the Methocel HG products is permitted under an extension of the effective date of the statute to March 6, 1961 (*Federal Register*, 1071, February 6, 1960).

LATEX THICKENER. Methocel products work exceptionally well with latexes as viscosity control agents, stabilizers, and plasticizer dispersants. Other uses for Methocel with latex are for adhesives, paper and textile coatings, dipped rubber goods, and paint.

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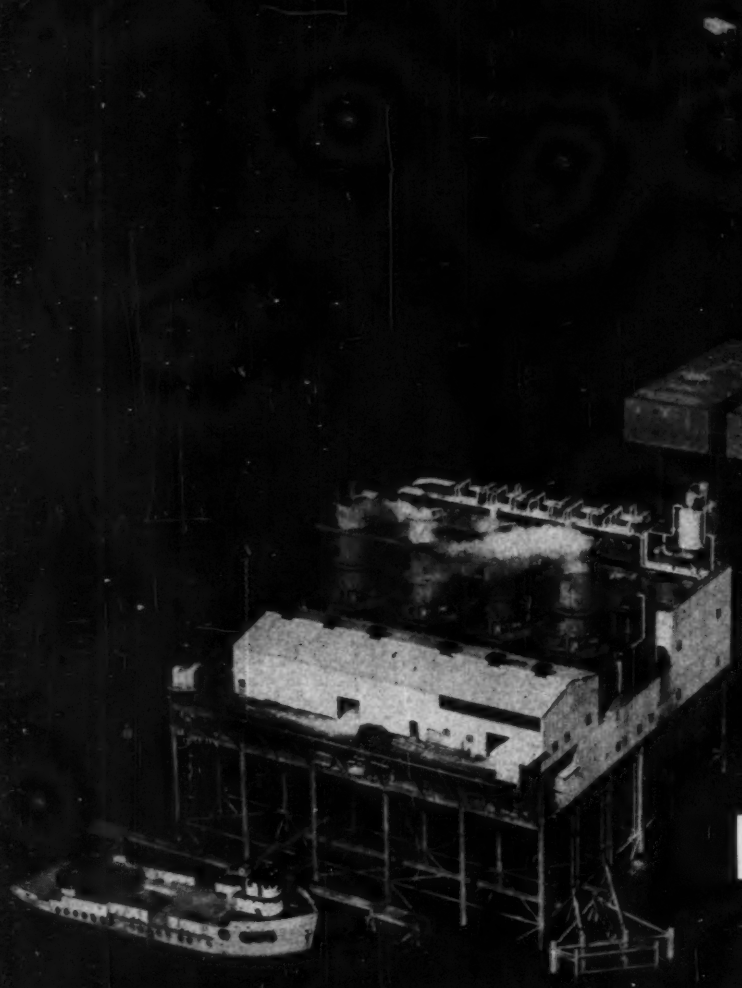

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LETTERS

No Leadburners

TO THE EDITOR: We read with considerable interest the article (*July 2, p. 47*) about glass-lined equipment in chlorine dioxide generation.

So far as the generators themselves are concerned, our firm had the privilege of fabricating the first of these for Mathieson quite a few years ago from our Ferrolum lead-surfaced steel. . . .

The article implies that because leadburning is a lost art this might topple lead from its perch as the more popular chlorine dioxide generator lining. These units are factory-produced by a process that completely eliminates leadburners.

As to maintenance, we have repair techniques that any mechanic can employ, and these are far simpler than repairing glass-lined equipment. . . .

ALFRED P. KNAPP
Chairman
Knapp Mills Inc.
Long Island City, N.Y.

Right Name, Wrong Firm

TO THE EDITOR: In CHEMICAL WEEK there appeared an incorrect statement concerning Du Pont's fibrous potassium titanate (*Feb. 27, p. 104*).

Resistotherm is the tradename of Resisto Chemical, Inc., for its processed form of Du Pont's fibrous potassium titanate, a new insulating material. Du Pont's tradename for fibrous potassium titanate is Tipersul. Therefore, Resistotherm is not a tradename or product of Du Pont.

G. H. SNYDER
Specialty Products Section
E. I. du Pont de Nemours & Co.
Wilmington, Del.

Capacity vs. Production

TO THE EDITOR: In the article "Wet Processing Boosts Florida Fertilizer" (*CW, Aug. 27, p. 72*) the statement is made that "the technology for producing wet-process acid from Western rock has not been attempted, and only furnace acid is now feasible."

As we have sold Bird-Prayon filters for producing approximately 200,000 tons/year (100% P_2O_5 basis) of wet-process acid, we feel that the Western producers have been slighted by this statement.

While the technology is somewhat different and Western rock is harder to process, this capacity does represent a substantial portion of national production, and is, we believe, a credit to Western producers.

WILLIAM F. WHITE
Sales Engineer
Centrifugal and Filtration Equipment
Bird Machine Co.
Walnut Creek, Calif.

Reader White is correct when he says that we have unjustly slighted Western producers. However, his figure represents capacity rather than production. Latest U.S. Dept. of Commerce estimate is that 100,000 tons of the 1,140,000 tons of wet-process phosphoric acid produced in the U.S., in '59, came from the West.—ED.

MEETINGS

American Institute of Mining, Metallurgical and Petroleum Engineers, fall meeting, Denver, Colo., Oct. 2-5.

Society of Plastics Engineers; theme: "Plastics vs Corrosion"; Mark Hopkins Hotel, San Francisco, Oct. 5.

Technical Assn. of the Pulp and Paper Industry, fifth de-inking conference, Conway Hotel, Appleton, Wis., Oct. 5-7.

American Institute of Mining, Metallurgical and Petroleum Engineers, Rocky Mountain Minerals Conference, Newhouse Hotel, Salt Lake City, Utah, Oct. 5-7.

American Assn. of Textile Chemists & Colorists, 1960 national convention, Sheraton Hotel, Philadelphia, Pa., Oct. 6-8.

International Plastics Congress, Amsterdam, Holland, Oct. 10-12.

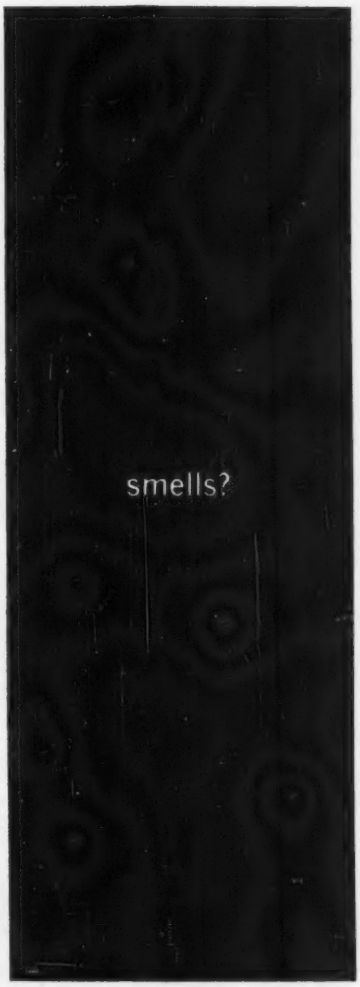
Technical Assn. of the Pulp and Paper Industry, 10th corrugated containers conference, jointly sponsored with Technical Section, Canadian Pulp and Paper Assn., Royal York Hotel, Toronto, Can., Oct. 10-13.

Synthetic Organic Chemical Manufacturers Assn., meeting, Roosevelt Hotel, New York, Oct. 11.

The Magnesium Assn., 16th annual convention, Pick-Carter Hotel, Cleveland, Oct. 17-19.

Technical Assn. of the Pulp and Paper Industry, 15th plastics-paper conference, Hotel Syracuse, Syracuse, N. Y., Oct. 17-19.

Commercial Chemical Development Assn. (New York) and Chemical Economics Division of Chemical Institute of Canada, joint meeting, theme: "The Chemical Industry—Canada and the U.S.A."; Queen Elizabeth Hotel, Montreal, Oct. 18.



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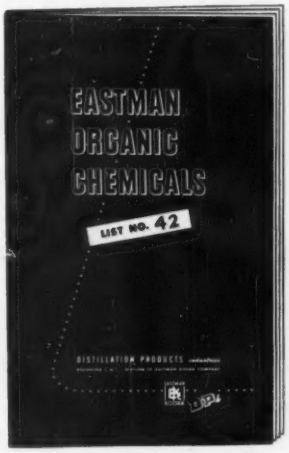
The new list is **GREEN**

If your copy of the Eastman Organic Chemicals catalog isn't green and doesn't say "No. 42," then it isn't up-to-date. Many changes are incorporated in Eastman Organic Chemicals List No. 42. A copy of it has now been mailed to every living soul of whose interest we are currently certain. We thought we had better remind you that if you haven't received the new green one by now, its absence indicates we don't know you want it.



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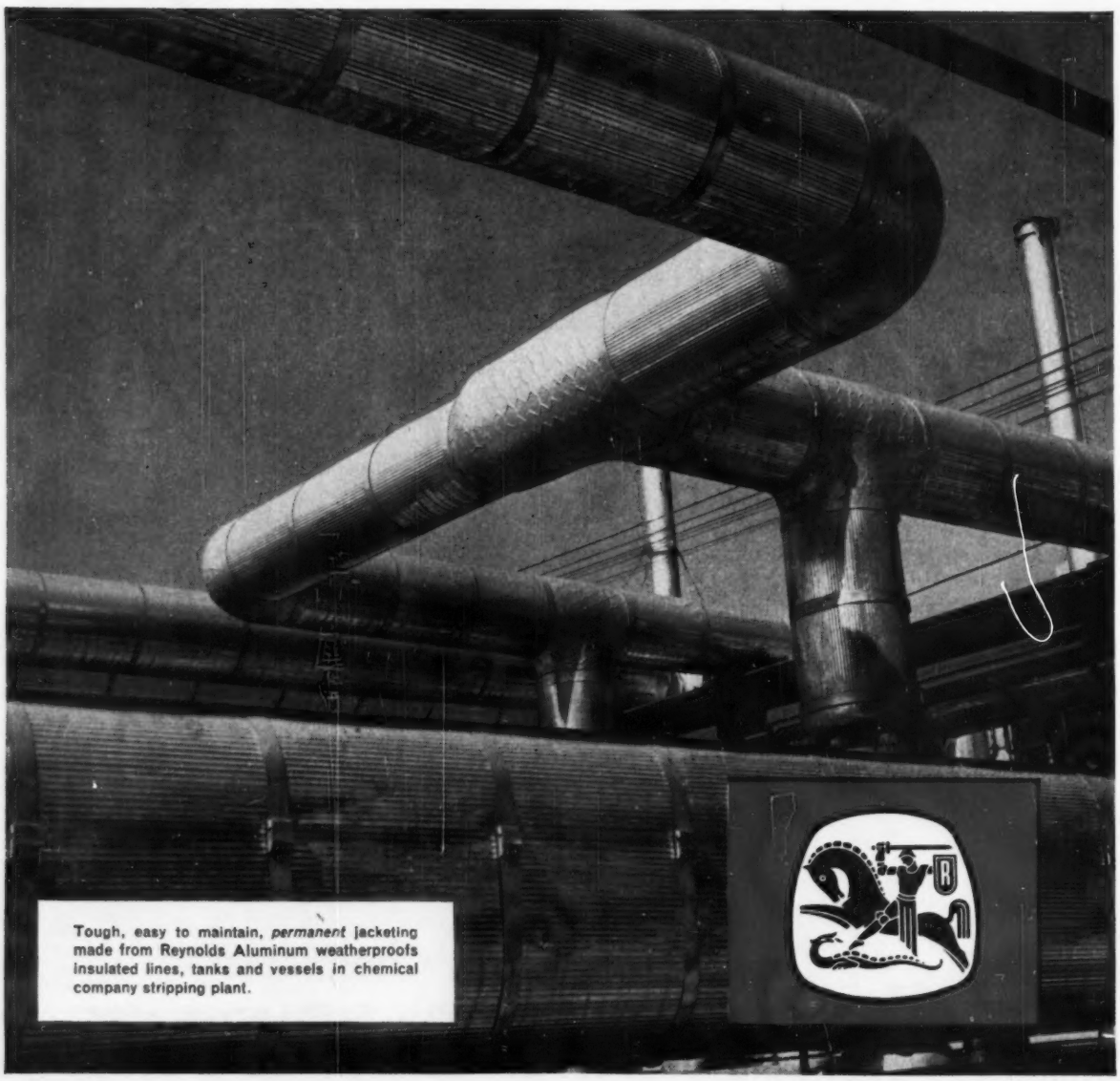
Aluminum Jacketing

...how it improves appearance, cuts installation, maintenance costs



Tough, easy to maintain, *permanent* jacketing made from Reynolds Aluminum weatherproofs insulated lines, tanks and vessels in chemical company stripping plant.

Aluminum jacketing stays clean and new-looking with a minimum of upkeep. And that holds true in the toughest jobs in the chemical and petroleum processing industry. Jacketing made from Reynolds Aluminum cuts costs in many other ways, too. Here's how:

CORROSION-RESISTANCE

Many industrial atmospheres, chemicals, gases and contaminants literally eat jacketing materials away. Jacketing of Reynolds Aluminum stays strong, clean and rust-free in most corrosive atmospheres, handling most corrosive materials, in any climate or weather condition. *And it needs no repetitive maintenance.*

EASY TO INSTALL

Lightweight aluminum is one of the most workable, formable of metals. That means faster, easier installation, and less time and labor on the site. You can cut and shape aluminum jacketing with ordinary hand tools, and can use larger sheets because it is so light. Weighing only ⅓ as much as steel—or less—aluminum jacketing can save in shipping, handling, installation and supporting structure costs.

GOOD INSULATION PROPERTIES

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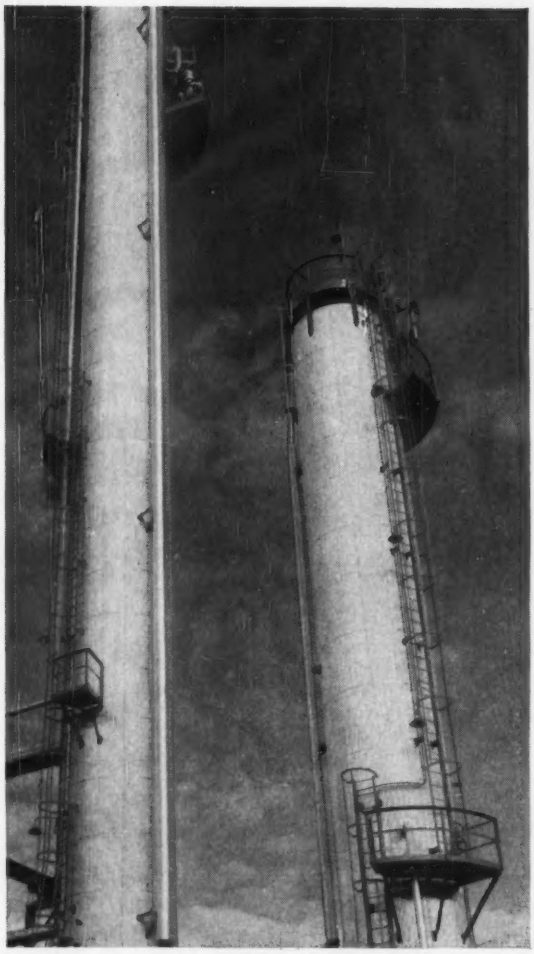

Suntide Refining Co. tower in platforming and rexforming unit—jacketed in Reynolds Aluminum.

Of course, aluminum's properties are important to chemical and petroleum processing men in other applications as well as jacketing. In process pipe, for example, where Reynolds Aluminum's light weight and weldability saves hundreds of man-hours on installation. Tanks and vessels, heat exchangers, are all using more and more aluminum, too.

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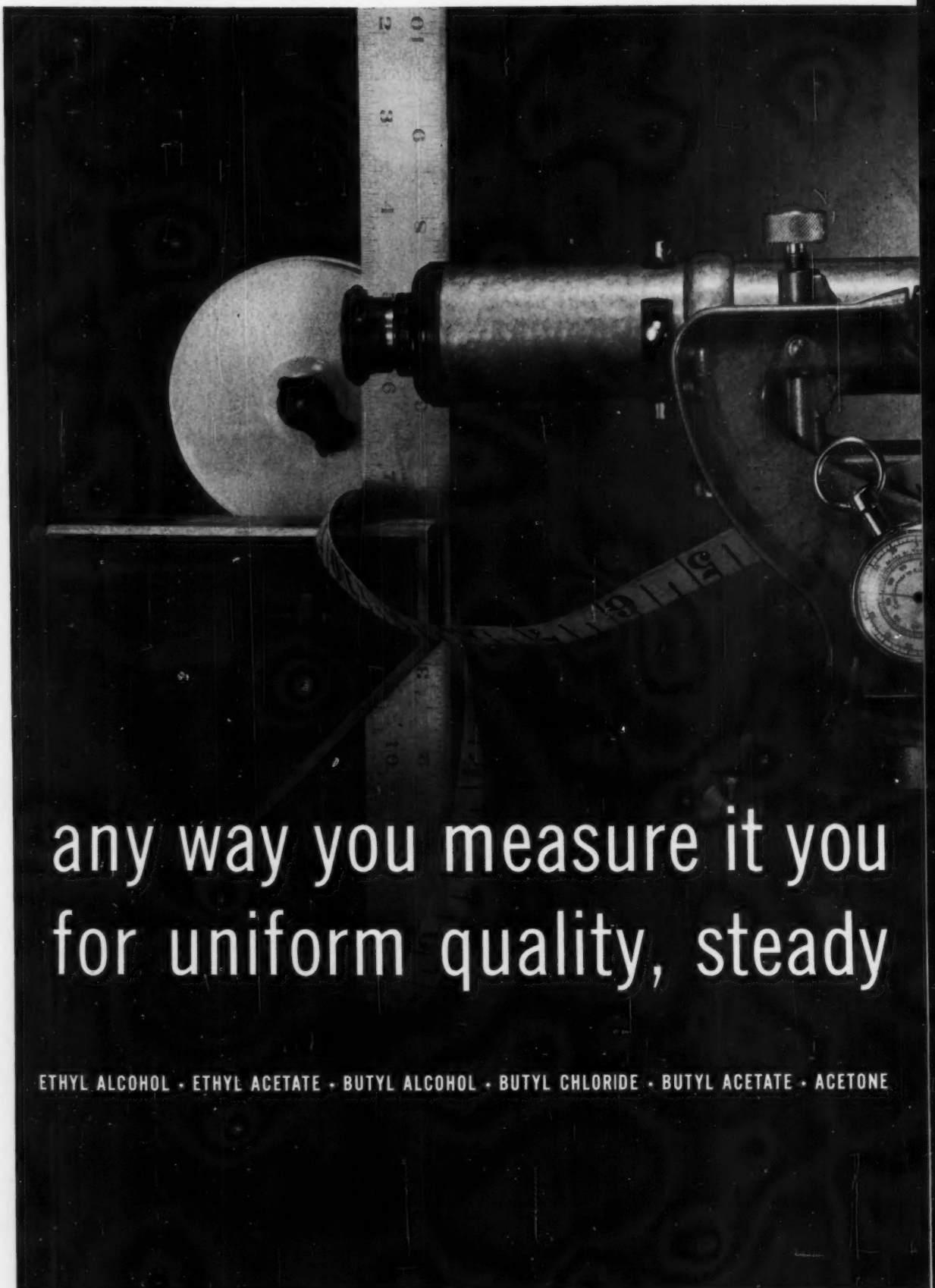
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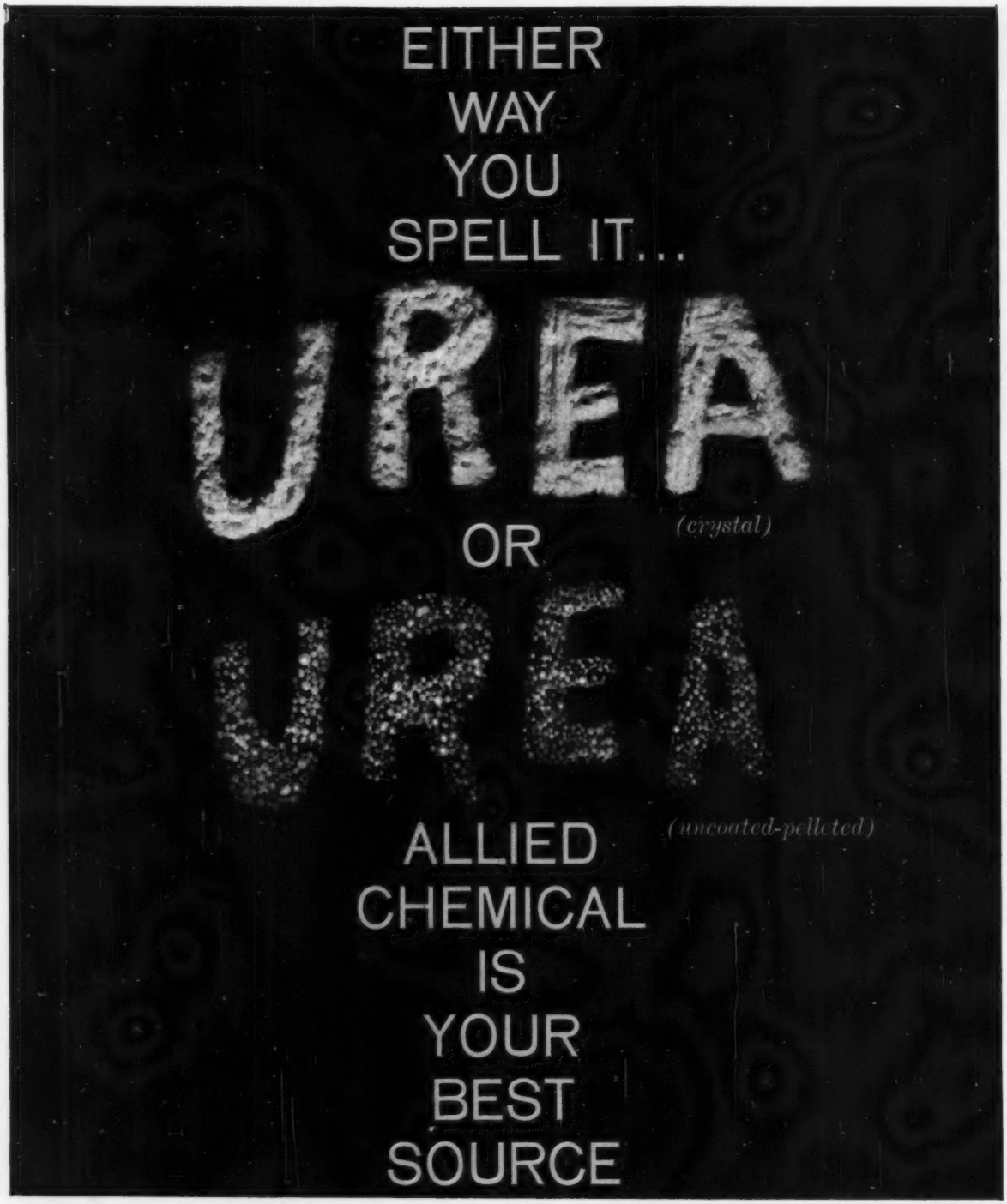

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Business
Newsletter

CHEMICAL WEEK
October 1, 1960

Although chemical sales this year are still heading toward $28 billion—the '60 total predicted last December and rechecked by the Manufacturing Chemists' Assn. last month—profits are not keeping pace. And current outlook for only so-so business from now through December indicates that the projected 9% increase in sales of chemicals and allied products (over last year's $25.7 billion) will be coupled with a significant decrease in net earnings.

Note how the sales picture changed in July (latest month for which government figures are available): at the end of June, sales of chemicals and allied products were running nearly 13% ahead of the mid-'59 total. Came a relatively slack period in July, and the gain dropped to 11.5%. If the industry total is to hit $28 billion this year, sales during these last five months will have to be fully 5% higher than in last year's August-through-December period.

Individual companies' estimates vary considerably. Dow Chemical—one of the largest in the industry—says its sales for the three months ended Aug. 31 were ahead of last year's $191.7 million, but earnings were less than the $22.3 million cleared in the corresponding period of '59. American Cyanamid expects its third-quarter sales and earnings will both be down from '59 levels but looks for a fourth-quarter upturn. On the other hand, Pennsalt Chemicals finds things going well, is thinking of giving stockholders an extra dividend "at least" as high as '59's 10¢ year-end dividend.

Pharmaceutical companies also have a mixed outlook on this year's results. Parke, Davis figures its net earnings will be up about 5% from last year's total; Cutter Laboratories has revised downward an earlier estimate for a nearly 15% gain in earnings, is now not sure whether this year's net will equal last year's. Schering Corp. thinks its third-quarter profit will be down 25% from last year; it expects a cost-cutting program to achieve some results in the fourth quarter but still calculates that 12-month earnings will be well below those of '59.

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But the industry is maintaining cash flow at a high level, despite lagging profits. Some economists have suggested that for U.S. business as a whole, declining profits will mean a pinch on retained earnings and hence a cutback on capital spending. However, six-month figures compiled by the Securities & Exchange Commission and the Federal Trade Commission indicate that producers of industrial chemicals will not have to trim their expansion and modernization budgets for lack of internal funds—traditionally their major source of capital. In first-half '60 vs. first-half '59, cash flow was down 6.5% for all U.S. manufacturing; 4.4% for producers of chemicals and allied products; but less than 1% for makers of basic chemicals.

Business

Newsletter

(Continued)

It's going to be more difficult to find a CPI firm that doesn't deal with Dresser Industries (Dallas, Tex.). This concern has just acquired Podbielniak, Inc. (Chicago), a major producer of distillation and solvent extraction equipment. Dresser's lineup of operating companies already included Magnet Cove Barium Corp. (drilling muds and chemicals), Clark Bros. Co. (compressors, engines and gas turbines), Pacific Pumps (centrifugal pumps), Roots-Connersville Blower Division (air-handling equipment), Dresser Mfg. Division (pipe fittings), and Southwestern Industrial Electronics Co. (electronic testing and control systems).

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The "Big Three" soapmakers have won another procedural point —at least tentatively—in the civil antitrust case that has been pending against them for nearly eight years in U.S. district court at Newark, N.J. (*CW, Jan. 31, '59, p. 80*). Federal Judge Richard Hartshorne late last week ruled that the three defendant companies—Procter & Gamble, Colgate-Palmolive, and Lever Bros.—have established that they should be allowed to look at proceedings of the 1951 grand jury that refused to indict them. In Washington, the Justice Dept.'s Antitrust Division—which so far has successfully opposed letting anyone inspect such proceedings—says it hasn't decided whether to ask the Supreme Court to reverse Hartshorne's order.

The soap companies have maintained that they need to study the grand jury minutes to prepare their case. They've contended that the Justice Dept. should not be allowed to launch a grand jury investigation—or to use company secrets obtainable only through such a probe—when the government's only real purpose is to get evidence to be used in a civil action.

•

Celanese Corp. will buy a 1,000-acre tract at Bay City, Tex. —an area that has been left fallow by chemical plant builders. No refinery is in the area, but Celanese feels that raw material supplies are close enough for its "multimillion-dollar" petrochemical plant. Celanese says it hasn't decided on the products.

•

Another new entry in the scramble for domestic beryllium ore: Beryllium International (Washington, D.C.), which last week acquired an option on 13 original beryllium claims in south-central Idaho, this week took option on 27 claims in the Delta, Utah, area. This land adjoins the mining area that is being worked by Beryllium Resources (Salt Lake City).

Meanwhile, Beryllium Resources is working with Dynamic Metals Corp. and Brush Beryllium to prove out the economics of the Van Dornick flotation ore separation process in a new pilot plant (*CW Technology Newsletter, Aug. 6*).

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CW PHOTOS—GEORGE WOODRUFF

Binney, Williams, Roche: New sales, production opportunities opening in Common Market area.

Europeans Challenge U.S. to Gear Policies

In bright, cool weather on the New England seashore last week, industry experts from five nations challenged U.S. chemical companies to rethink their operating policies in view of rapidly changing world market conditions.

Distribution programs in particular, it was stressed, should be re-evaluated to take into account total world market possibilities. Direct investments are becoming more desirable in the European Common Market, which is fast becoming a convenient and superior mass market.

And this is especially the case, according to Ralph Binney, head of the International Division of the First National Bank of Boston, if the Common Market merges with the "outer seven" nations of the European Free Trade Assn. This, Binney believes, is a distinct possibility within two years.

Such was the nature of the challenge heard by some 475 chemical marketing executives and specialists at Wentworth-By-The-Sea near Portsmouth, N.H., for the fall conference of the Chemical Market Research Assn.

For U.S. chemical companies, economic integration in Europe spells both greater competition and more opportunity, according to both U.S. speakers—Binney, the keynoter; and the U.S. Commerce Dept.'s George Becker, Jr., deputy assistant secretary of commerce for international affairs.

Detailed information about chemical industries and chemical markets in Europe's four largest nations—United Kingdom, West Germany, France and Italy—came from speakers from those countries.

GERMANY'S NEW RIVAL

The Federal Republic of Germany (West Germany) is today the largest chemical producer of the European Economic Community. Last year it turned out close to 47% of total EEC production. But because of the large resources of natural gas and oil available to the French and Italian industries, the German chemical industry will find it increasingly difficult to maintain this share in the future.

That startling admission was revealed in the comprehensive report, "The Chemical Industry in West Germany," that kicked off the Thursday morning presentations by European experts. The paper, prepared by H. G. Sinkel, director of sales for Chemische Werke Huels, was read by Roger Williams, Jr., president of Roger Williams Technical and Economic Services. (Williams explained that Sinkel had suffered a heart attack and could not make the trip from Germany.)

With the aid of some 24 slides, Herr Sinkel outlined the past, present and future of the Federal Republic's chemical position in the Western world. But he also discussed activities behind the Iron Curtain.

"It is to be noted," read Williams, "that the entire chemical industry being developed in the U.S.S.R. at present had already been planned before the war. Former obstacles, such as the lack of trained personnel and electric power, have now been overcome so that the vast raw material resources may be fully utilized within the scope of the seven year plans."

Plant Investments Up? Regarding Germany, the Sinkel paper indicated there is a good chance that a total of $476 million will go toward German capital expansions during '60. Possible obstacles to such growth,

Townsend, Ballabio: Chemical firms in U.K., Italy step up growth.

to Over-all World Market

though, could be a labor shortage and the resulting "inability of the supplying industries to fully satisfy the requirements of the chemical industry for capital goods."

The crisis in the capital goods market actually held down chemical industry investments to approximately $415 million last year, or some 8.4% of the industry's turnover (sales) compared with the 9.3% spent in '58.

A segment of the Sinkel paper that had the CMRA attendees scribbling industriously was financial data on major German chemical companies. The largest, he said, is Farbenfabriken Bayer AG. of Leverkusen. The firm's sales in '59 were approximately $585 million, with exports amounting to about $255 million. The number of company employees last year totaled about 55,000, resulting in a "turnover [sales] per employee of $10,630, a figure well above the West German average."

Badische Anilin- & Soda-Fabrik (Ludwigshafen) had sales of approximately $540 million, with the export share amounting to $205 million. The number of employees reached about 43,600, and the "turnover per employee ran up to $12,380, also considerably exceeding the average."

Third in the lineup is Farbwerke Hoechst AG. (Frankfurt). Sales in '59 were $530 million, with exports accounting for some $170 million. Hoechst employs about 45,400, and the "turnover per head" was $11,660.

Among the next largest companies, with sales ranging from $190 million down to $22 million, were the combine Degussa (Deutsche Gold- & Silber-Scheideanstalt) of Frankfurt, Dynamit-Nobel AG. of Troisdorf, Wacker-Chemie GmbH. (Munich), Kali-Chemie AG. of Hannover, Chemische Werke Albert of Wiesbaden, and Chemische Werke Huels AG. of Marl.

Petrochemical Fill-in: One of the significant developments in West Germany has been the remarkable increase in capital expenditures for petrochemical facilities despite a traditional reliance on coal as a basic raw material. The Federal Republic is second, behind Great Britain, among European petrochemicals producers. German investments in this field increased from $173 million in '57 to about $263 million in '58. (Latest OEEC estimates indicate German expansions by the end of '61 will have increased $250 million.)

In the manufacture of plastics, West Germany ranks second in world production, behind the U.S. Output of German polypropylene and polyethylene (low- and high-pressure) rose from 6,500 tons in '55, to about 66,000 metric tons in '59. By 1961-'62, polyethylene capacity—and consumption—is expected to reach some 125,000 tons.

In some areas, though, the Federal Republic has become an importer of chemicals to keep its industries going. Among the products brought in, mainly from the U.S., were toluene, xylene, benzene and naphthalene.

FRENCH ENCOURAGE

"As a chemical producing country, France ranks second in the Common Market area, third in Western Europe, sixth in the world." This statement kicked off the talk by Jacques Roché, export promotion consultant for the French chemical industry association, Union des Industries Chimiques.

But Roché's presentation went far beyond that statement. In a close look at industry's prospects, for example, he cited these upcoming expansions:

- Capacity for olefin derivatives (151,000 tons in '58) will climb to 362,000 tons in '62. Included: synthetic resins and plastics, polyethylene, polyvinyl chloride, polypropylene, epoxy resins.
- French production of diolefin derivatives is slated to climb to about 80,000 tons/year, will consist chiefly of synthetic rubbers (butyl, nitrile, SBR) and "kralastic resins."
- Aromatic hydrocarbon capacity should reach 67,000 tons/year in '62, nearly double the '58 potential.
- Carbon black capacity in France will more than triple (to 100,000 tons/year) when new plants come in at Port-Jerôme and Bec d'Ambès.

In addition, capacity for ammonia —from fuel-oil gas, refinery gas and natural gas—will climb to a little under 400,000 tons by the end of '60.

The French chemical industry, said

For France, U.S. Is Second Among Chief Export Markets

Country of Destination	Chemicals, Allied Products Exports (million dollars)
Western Germany	39.1
United States	**25.6**
United Kingdom	21.9
Italy	21.7
Switzerland	20.9
Belgium & Luxemburg	20.7
Netherlands	13.0
Spain	8.3
Sweden	7.3
Denmark	4.0
Austria	2.8
Norway	2.5
Portugal	2.5
Other countries .	95.3

French Chemical Production: Heavy Gains in Seven Years

(thousand metric tons)	1952	1959
Inorganic chemicals:		
Sulfuric acid	1,190	1,827
Soda ash	635	775
Ammonia	295	663
Caustic soda—		
Electrolytic output	95	243
Total production	400	500
Calcium carbide	226	347
Chlorine	106	275
Organic Chemicals:		
Methanol	18	46
Formaldehyde	10	20.2
Phenol	14.4	41.8
Acetone	6.2	38.2
Phthalic anhydride	4	26
Fertilizer materials:		
Potash	867.3	1,448.9
Phosphate	270	474
Nitrogen	294.6	556.5

United Kingdom Petrochemicals Output: A Tripling in Six Years

	Thousand Tons (carbon content)		
1953	140	**1957**	300
1954	180	**1958**	330
1955	220	**1959**	420
1956	240	**(prelim.)**	

U.S. and U.K. Chemical Production, 1958

	Total (million short tons)		Per Capita (pounds)	
	U.S.	U.K.	U.S.	U.K.
Sulfuric acid	15.3	2.5	172	97
Synthetic alkalis	8.0	2.0	90	77
Nitrogen fertilizer	2.4	0.4	27	15
Ethylene	2.1	0.3	23	12
Benzene	1.1	0.1	12	4
Calcium carbide	0.9	0.2	10	8
Carbon black	0.8	0.1	9	4
Titanium dioxide	0.4	0.1	5	4
Synthetic fibers (noncelullosic)	0.3	0.04	3.2	1.3

Italy's Mounting Output: Plastics Up Fivefold; Synthetic Fibers Up 11-fold

	Plastics (tons)	Synthetic Fiber (million pounds)
1953	52,000	4.6
1954	78,000	9.7
1955	95,000	12.3
1956	111,000	18.0
1957	149,000	23.2
1958	180,000	32.5
1959	253,000	50.0

Italy's Basic Chemicals: Production Keeps Climbing

(thousand tons)	1957	1958	1959
Inorganic chemicals:			
Sulfuric acid	2,064	2,031	2,053
Nitric acid	826	865	949
Hydrochloric acid	94	103	117
Ammonia	487	609	726
Caustic soda	296	274	343
Soda ash	478	415	491
Calcium carbide	248	320	299
Carbon bisulfide	44	40	46
Organic chemicals:			
Acetic acid	28	35	35
Phenol	10	15	11
Methanol	39	43	48
Formaldhyde	21	20	24
Urea	90	108	119

Roché, is much more spread out than in other countries. The 10 leading French firms account for 25% of the yearly turnover (sales), whereas, he said, "three German firms account for 31%, and a single Italian company for 50% of their countries' sales."

Climbing in '60: Touching further on the "progress of expansion" this year, Roché revealed some production data for the first six months of '60, compared with the corresponding period in '59. Production of sulfuric acid increased 6.7%, ammonia 5.8%, chlorine 15.3%. But results seem even better for organics (*see tables*). Ethylene output is up 112%, methanol 74%, acetone about 36.5%, synthetic phenol almost 21.5%, PVC some 48%.

Increase in sales of industrial chemicals (exclusive of paints and varnishes, which increased 14.7%) amounted to 24%.

Furthermore, said Roché, production forecasts for next year, established in '56 by the official Plan Commission for Chemicals, have just been revised upward. The increases include 12% for hydrochloric acid (267,000 tons vs. 300,000); 15% for benzene and allied products (186,000 tons to 214,000); 30% for plastics (335,400 tons to 436,000).

"The French chemical industry," concluded Roché, "now has to face the double problem of an increasing demand in home and foreign markets: it seems . . . that the financial and technical efforts carried out since the last war have brought the most encouraging results."

BOOM IN BRITAIN

Britain's chemical industry—though only about 20-25% as large as that of the U.S.—is now comparable to the U.S. chemical industry in range of products, in rate of growth, and in relative outlays for expansion, modernization and research.

And speaker John H. Townsend, of Imperial Chemical Industries (London), Britain's largest chemical concern, further points out that Britain's chemical industry has been making impressive gains in productivity and in export sales.

Nearly 15% of the industry's 1958 sales were exports, Townsend told CMRA, and Britain's '58 chemical exports—nearly $740 million—accounted for about 15% of that year's total world trade in chemical products. Principal product groups in Britain's '58 exports: plastics (about $100 million), inorganic chemicals (more than $90 million), organic chemicals (nearly $80 million), and pharmaceuticals, dyestuffs, explosives and antiknock fluid. About 48% of those chemical exports went to British Commonwealth countries; 26%, to other Western European nations.

Ethylene capacity was about 670 million lbs./year at the start of '60, with more than 40% of production earmarked for polyethylene. He foresees a growing demand for ethyl benzene to make styrene, but predicts that Britain's milder climate will deter ethylene glycol from attaining the important position it holds—because of its big use in antifreeze—in North America. Unlike the U.S., the U.K. still relies mainly on coal-tar distillation for its aromatics—except that almost all of its *p*-xylene is petroleum-derived. Current output of the principal aromatics: benzene, 36 million gal./year; toluene, 11 million gal.

Britain's plastics production tripled during the past decade (*see table*), and continued growth at a fairly high rate is considered probable.

Britain has been a late-comer in synthetic rubber production, Townsend observes. He estimates that synthetic rubbers account for only about 30% of total U.K. rubber consumption, whereas its proportion in the U.S. is about 67%.

Production of dyes and pharmaceuticals has become an important segment of the industry in Britain, Townsend says. "Protection has assisted its growth, and has also led many foreign companies to establish branch factories in the U.K."

Nylon 66 accounts for about 60% of the U.K.'s synthetic fiber production, and ICI's Terylene polyester holds a 30% slice of the market. Output of noncellulosic synthetic fibers grew from almost 40 million lbs. in '55 to about 85 million lbs. in '59; and if the growth rate in the U.K. continues to follow the U.S. trend (but with a five-year lag), British production might reach 200 million lbs./year by the mid-'60s.

Prospects for the British chemical industry generally, reports Townsend, are considered good, with no difficulties expected in meeting needs for capital, labor or raw materials.

ITALY SHOWS VIGOR

Though Italy has traditionally lacked various basic raw materials, its chemical industry has become "one of the most lively and dynamic in Europe," according to Giulio Ballabio, director of Montecatini's Hydrocarbons and Derivatives Division.

And now, he feels, the industry's raw materials position has been substantially improved with recent discoveries of natural gas, potash, bauxite and petroleum.

Italy's chemical industry, Ballabio emphasizes, is broadening its range of products, improving product quality, and cutting production costs in an effort to overcome an "unfavorable balance" in chemical trade. There has already been progress in this direction: during '59, imports rose by 12.3% to $236 million but exports were boosted by 25.5% to $223 million; consequently, Italy's chemical trade deficit—which in '56 had drained off $56 million of Italy's dollar exchange—declined to $13 million.

Because of the importance of Italy's agricultural economy, fertilizer producers have been building plants and pressing for market development. Italian farmers have come to favor use of phosphates in complex mixed fertilizers, production of which reached 925,000 tons last year. Italy is the world's seventh largest producer of nitrogen compounds, Ballabio adds, with nitrogen fixing capacity of 750,000 tons/year. Since Italy's domestic market now takes only about half that figure, prices on the home market have been crumbling in recent years to the point where they barely cover production costs. With three companies now developing the potash deposits in Sicily, Ballabio feels that Italy's potash problem is solved and "we can also foresee that a considerable export stream will soon be flowing toward other countries."

Petrochemical Push: Production of petrochemicals has rocketed from 16,000 tons (carbon content) in '54 to 180,000 tons in '59. Plastics output is up fivefold from 52,000 tons in '53 to 253,000 (including 80,000 tons of PVC) in '59. Six producers are competing in polyamide fibers. Synthetic rubber output is climbing, and last year production of organic dyestuffs mounted by 36% to 15,000 tons.

Canada's Plea for Protection

Canada's present and future chemical tariffs—and their effects on that country's $250-million/year importation of U.S. chemical products—will be warmly debated over the next few weeks.

As the Canadian Tariff Board continues its long-running investigation of the chemical tariff problem (*CW, May 21, p. 21*), these developments are causing a new flare-up of interest in the subject:

• A committee representing the Canadian chemical industry is proposing a new chemical tariff policy that would be much more protective in nature than the present customs schedule. The industry committee's suggestion: a blanket 20% ad valorem most-favored-nation duty on imported chemicals (with some exceptions). This relatively high rate now applies to only about one-third of the chemical products consumed in Canada.

• A two-way, "frank and searching" discussion of relations between U.S. and Canadian industries at a scheduled Oct. 18 joint meeting of the Chemical Economics Division of the Chemical Institute of Canada and the Commercial Chemical Development Assn. of the U.S.

For Equal Treatment: The industry committee, headed by Du Pont of Canada's J. A. Davis, argues that a 20% rate should be taken as a starting point in drawing up a new chemical tariff code. This rate, the committee says, is the prevailing rate for numerous imported chemicals like those made in Canada.

A second suggestion from this committee is—as expected—running into stout opposition from spokesmen for farmers and certain other groups. This controversial proposal: to tighten up the rule under which chemicals not made in Canada are imported duty-free or at low rates.

At present the rule applies to chemicals "of a kind not made in Canada." The industry committee offered a list of some 500 chemicals not now made in Canada, suggesting that for now those products need not carry a protective tariff rate. But, the committee adds, the 20% blanket rate should be imposed automatically on any one of these chemicals if it begins to compete against any Canadian-made product, regardless of whether the imported chemical is the same as the Canadian product.

Two-Way Inquisition: The joint conference of CCDA and CIC's Chemical Economics Division—to be held Oct. 18 in Montreal's Queen Elizabeth Hotel—will include a half-day discussion of each country's chemical industry and its problems in trade, investment, finance and research.

In the morning, President W. N. Hall of Dominion Tar and Chemical and Executive Vice-President F. P. Wilson of Union Carbide Canada will speak on the Canadian chemical industry. Then they will face questioning led by two "inquisitors" representing the U.S. industry.

In the afternoon session, the U.S. chemical industry will be discussed by Executive Vice-President Norman Hathaway of Allied Chemical and President John Riley of Southern Nitrogen; two Canadian inquirers will lead the questioning to follow.

One other development relating to Canadian markets for U.S. chemicals: Oct. 1 is the deadline set by Canada's Food and Drug Directorate for registration of food additives. Thereafter the directorate will draw up a final "permitted list" of chemicals that may be used in foods distributed in Canada.

Balking at Rate Rises

Utility rate disputes pending this week in four chemical process industries centers are new evidence of current added pressures on the processors' operating costs—while their prices remain generally static.

Moves by suppliers of natural gas and electric power to increase rates in these areas have met with strong opposition from CPI companies that would be affected. These companies point out that increased rates would further reduce profits already affected by price cutting, spiraling manufacturing costs, and other adverse factors (*CW, Sept. 3, p. 21*).

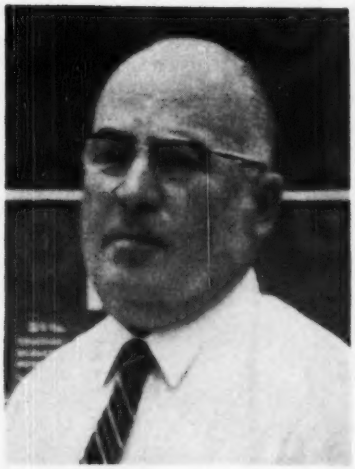
Two of the disputes involve California companies. In one, Pacific Lighting Corp., major southern California natural gas supplier, is contesting Tennessee Gas Transmission Co.'s plan to build a natural gas pipeline from south Texas through Mexico into the Los Angeles area.

Contending that the proposed pipeline would increase consumer gas rates, Pacific Lighting says it will fight the move before the Federal Power Commission and the California Public Utilities Commission if Tennessee Gas seeks their approval.

In the other California dispute, PUC denied a rehearing to five California companies—American Potash & Chemical Co., California Portland Cement Co., Riverside Cement Co. (American Cement Corp. division), Southwestern Portland Cement Co., and U.S. Borax & Chemical Corp.—which complained they are being overcharged for natural gas because of an interim increase recently granted to Pacific Gas & Electric Co. These companies protested that PUC had exceeded its authority in its decision to raise their rates 1.864¢/mcf. instead of ½¢/mcf. as asked by PG&E.

Meanwhile, in New Orleans, United Gas Pipeline Co. is seeking authority from the Louisiana Public Service Commission to raise the rate of resale of natural gas to 53 industrial gas consumers (including Flintkote, Johns-Manville, U.S. Gypsum, Lone Star Cement and others) in Orleans Parish. As the reason, United Gas cited sharply increasing gas costs, also asked permission to increase or decrease its rates automatically on the basis of purchase price increases or decreases. A committee representing the 53 companies said the proposed increases would not only increase the cost of operation for these companies but also would discourage the influx of new industries. The commission will reconvene with both groups in three months.

In still another area Niagara Mohawk Power Corp. has filed new electric rates with the New York State Public Service Commission. Citing rising costs of operation and increasing capital expenditures, Niagara has requested a 6% increase effective Oct. 31. The increase would raise NM's electric revenues by $11.2 million/year, but it would not affect CPI companies in the area—under terms of the current $720-million state power project—until at least '61, when the first phase of the project will have been completed.



IMC's Leonard Gopp: More demand for concentrated phosphates.

For Richer Phosphates

Two new developments this week point up the rapid rise of high-concentrate phosphate fertilizer materials.

International Minerals & Chemical Corp. (Skokie, Ill.) and Electric Reduction Co. (Toronto, Ont.) have signed a multimillion-dollar contract that IMC Vice-President Leonard Gopp says will help his concern "supply the growing demands of its customers for highly concentrated products."

The two companies hope to sew up the entire Canadian market for phosphatic fertilizer solutions and about 5% of the U.S. market.

And Olin Mathieson's Chemicals Division is putting its Blockson phosphate works at Joliet, Ill., into the fertilizer business. The division will build a $1.5-million evaporation processing unit to boost weak phosphoric acid solutions to 75% concentration. Total output will go into fertilizers. Capacity: 50,000 tons/year; completion date: next April.

Florida to Ontario: Under the IMC-ERC contract, IMC will supply calcined phosphate rock from its mine at Noralyn, Fla.; it is building an additional kiln there to handle the calcining. This treated ore then will go to Port Maitland, Ont., where ERC —a subsidiary of Albright & Wilson (London)—is building a $12-million plant. ERC will process the ore into wet-acid phosphate, dicalcium phosphates, feed additive, triple superphosphates and sodium tripolyphosphate; and IMC will serve as U.S. sales agent.

Trusteeship for Century?

Century Chemical Corp. (New York)—the 1½-year-old concern that early this year was confidently looking forward to solid growth and a $4-million expansion program — has entered bankruptcy proceedings.

Harassed by litigation brought by at least five impatient creditors, Century took the step in Manhattan's federal district court to keep the company in business and to prevent individual creditors from pecking away at its assets in state and local court actions.

U.S. District Judge Edward Dimock granted Century's petition for proceedings under Chapter XI of the federal bankruptcy laws, and appointed Herbert Lowenthal to serve as referee. Outlook is that Lowenthal—a government lawyer who for more than a decade has been working full-time as referee in bankruptcy actions—will hold hearings concerning appointment of a trustee and preparation of a plan for paying the creditors. Actually, two parallel proceedings are pending—one for Century, another for Chemo Puro Mfg. Corp., an affiliate.

Trying to Survive: As of now, Century's management is striving to cut costs, boost sales, and keep the company alive. Vice-President William Brockman told CHEMICAL WEEK that one of the first moves will be to close out the $33,000/year lease on the offices the company has been renting on New York's Madison Avenue and move the greatly reduced headquarters staff to the Chemo Puro plant, on the Passaic River at Newark, N.J.

Another move in the works is an attempt to line up new products, to replace a number of unprofitable products Century has been marketing on a resale basis.

But Century's best hopes may lie in merger. Century itself was formed last year through acquisition of Chemo Puro, producer of more than 100 chemical specialties and intermediates; Wilson Organic Chemicals (Sayreville, N.J.), producer of organic dyes and pigments; Oil and Chemical Terminals (Newark), operator of storage tanks and a business in asphalt paving and roofing products; and W. A. Butler Co. (Harrisonburg, Va.), an animal feed and supply firm. Now the shoe is on the other foot: "We are always interested in talking to anyone who is interested in acquiring us," says Brockman.

Summer Brings Sadness: In the early months of this year, it appeared that Century's founder—Ted Hodgins, formerly research vice-president for Reichhold Chemicals—had put together a winning combination. For a time, sales neared an annual rate of $10 million, and there was no trouble raising new capital by selling nearly $2 million worth of debentures through Stone and Webster Securities Corp. (New York).

But by summer, Century's sky was clouded. The national economy was not booming as had been expected; the Wilson operation was still losing money; there was trouble inside Century's marketing staff; too much of total volume was found to be in the low-profit resale items. End of the company's fiscal year June 30 brought word that over-all results boiled down to a $500,000 net loss. The expansion program was set aside, and a new sales manager was brought in.

Investors Intervene: Next news from Century was that creditors were getting restless and that Stone and Webster Securities had decided to step in. The investment house sent one of its vice-presidents, Emmons Blodgett, to talk things over with Century's board. The directors moved Hodgins up to chairman, installed Blodgett as executive vice-president and chief executive officer, and persuaded creditors to give Blodgett a chance to put affairs in order (*CW, Sept. 10, p. 130*).

Blodgett's stringent economies calmed most of the larger creditors, but several small creditors were insistent and went to court. In one case, American Chemicals Co. won a judgment to recover $745.60, and New York's city marshal carried out the order with a levy on Century's bank account.

Among principal creditors listed by Century and Chemo Puro: Naftone, Inc., $53,227; Union Carbide Chemicals, $47,089; Hostachem Corp., $35,157; Aktiebolaget Bofors Nobelkrut, $25,510; Heyden Newport, $23,355.

COMPANIES

National Lead Co. (New York) and Bunker Hill Co. (San Francisco) have signed a contract under which National Lead will purchase all of the primary lead and high-grade zinc and cadmium from Bunker Hill's Kellogg, Ida., facilities. National Lead will market these metals under the Bunker Hill brand, starting next Jan. 1.

•

The Fluor Corp. (Los Angeles) has sold its 60% interest in H. G. Acres & Co. (Niagara Falls, Ont.) to Conseco, Ltd., a holding company composed of 21 senior members of the Acres organization. Fluor had used Acres as a Canadian engineering affiliate since '53 but for the past two years has engineered Canadian projects from its California office.

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Montrose Chemical Co. (Newark, N.J.), Baldwin Rubber Co. (Pontiac, Mich.) and Centlivre Brewing Corp. (Ft. Wayne, Ind.) have been negotiating toward a three-way merger. The resulting entity: Baldwin-Montrose Chemical Co. Montrose—now owned 50-50 by Stauffer Chemical and Montrose of Calif.—calls itself the world's largest producer of DDT, also turns out other organic chemicals and plasticizers. Sales last year were $3.6 million. Baldwin manufactures auto and rubber products, had a sales volume last year of $18 million. Centlivre recently bought General Artists Corp., a New York talent agency.

•

St. Paul Ammonia Products (South St. Paul, Minn.) is asking the Securities and Exchange Commission to approve a secondary offering of securities by several of the company's principal investors. The registration statement covers 33,250 common shares acquired last year by White, Weld & Co., New York investment house; warrants owned by Northwestern Mutual Life Insurance Co. for purchase of 60,000 common shares at $2.50; and $60,000 worth of debentures acquired last year by R. Campbell, the company's board chairman.

EXPANSION

Titanium Dioxide: British Titan Products (Canada) has broken ground for construction of its $16-million titanium pigment plant at Tracy, Que. (*CW, Dec. 19, '59, p. 26*). The company—a subsidiary of British Titan Products (London)—will produce titanium dioxide for use in paints, paper and rubber when it goes onstream within two years.

•

Gypsum: Bestwall Gypsum Co. (Paoli, Pa.) broke ground this week, after more than a month of preliminary work, on its $7.5-million building products plant at Wilmington, Del. This plant—the company's 12th—is its first in the Middle Atlantic states. Completion is expected within a year.

Pharmaceuticals: Baxter Laboratories (Morton Grove, Ill.) has purchased a 47-acre site near Kingstree, S.C., and last week started construction of a 92,000-sq.ft. plant. The unit will produce intravenous solutions for hospital use, blood equipment and pharmaceutical specialties.

•

Ammonia: U.S. Phosphoric Products (Tampa, Fla.) has awarded a contract to Chemical Construction Corp. (New York) to build a "multimillion-dollar" ammonia plant in Tampa. Planned for completion in late '61, the 350-tons/day plant will use natural gas feedstock.

FOREIGN

Detergents/Germany: Procter & Gamble has founded a subsidiary in Frankfurt. Initially, the new subsidiary will sell products produced by P&G elsewhere; later it will open a plant there to make detergents, light chemicals, cosmetics and foodstuffs.

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Petrochemicals/Brazil: Soviet Union engineers are designing for Brazil a plant that will process shale into gas and petrochemicals. The plant, with gas capacity of more than 1 million cubic meters/day, will be patterned after Soviet plants.

•

Phosphorus, Chlorine/Brazil: Fosfocloro de Nordeste S. A. has been formed to produce phosphorus and chlorine products in Recife, Brazil.

•

Fertilizers/Holland: Mekog of Ijmuiden will build a mixed fertilizer plant near Rotterdam. The 160,000 tons/year unit is expected to start operations in '62. Mekog is jointly owned by Royal Dutch/Shell (two-thirds interest) and Royal Netherlands Blast Furnaces.

•

Chemicals/Japan: Wood Chemical Industry Co. (Tokyo) will construct Japan's first major wood chemical plant at Asso in Wakayama prefecture. It will use a new hydrochloric acid process developed by Asahi Chemical and Shin Nippon Chisso. Initially, total capacity for crystallized dextrose, lignin, potassium sulfate, xylose and other chemicals will be 10,000 tons/-year.

•

Acrylonitrile/Japan: Asahi Chemical Industry (Tokyo) is building a $4-million acrylonitrile plant in Kawasaki, near Tokyo. Upon completion next May, it will produce up to 15 tons/day. Asahi says it will use its own process instead of the propylene-and-ammonia process developed by Standard Oil of Ohio.

•

Synthetic Fibers/Belgium: S. A. Fabelta, a leading Belgian fiber manufacturer, has developed an acrylic and a polynosic fiber. Construction of a new plant for the acrylic will start early next year; output of the polynosic fiber will begin late this year.

CW PHOTOS—ED WALLOWITCH

Korky Kaulakis is counting on person-to-person contact for . . .

Esso Engineering's New Look

Esso Engineering, the 40-year-old mainstay of Esso Research and Engineering Co., has been spending a year getting itself a new look. In Sept. '59, it moved from Linden, N.J., to a new center at Florham Park, N.J. Last March, Arnold (Korky) Kaulakis took over as its acting general manager, following the retirement of Charles Paules. In May, its "Standards and Purchase Specifications," long a standard in the industry, was replaced by "Esso Basic Practices" (*CW, June 4, p. 33*). And a month ago, it was reorganized for more emphasis on specialization and individual performance. In a special interview with CHEMICAL WEEK, Kaulakis last week spelled out the management principles he will use in guiding Esso Engineering's operations.

About 600 engineers are affected directly. Most of them are men Kaulakis calls professionals, who divide their time between development work on new technology, on-the-spot trouble-shooting throughout Jersey Standard's worldwide network of operating plants, and project design work for new refineries and petrochemical plants. This last phase alone, project design, keeps about $300 million of new designs in the office at all times, an indication of the extent of Esso Engineering's operations.

Comparison with some of the well-known engineering contractors points this up. For example, a typical large engineering firm, such as Catalytic Construction Corp., Chemical Construction Corp., Fluor, or Lummus, handles $50-80 million in new plant construction annually, while the larger firms—e.g., Kellogg and Stone & Webster—handle about $200 million in plants each year.

Esso, however, limits itself to basic design work and does little of its own drafting. This points up its emphasis on basic engineering — and Kaulakis's emphasis on individual contributions and personal accomplishments. The management philosophy through which he gets this kind of individuality rests on three basic principles:

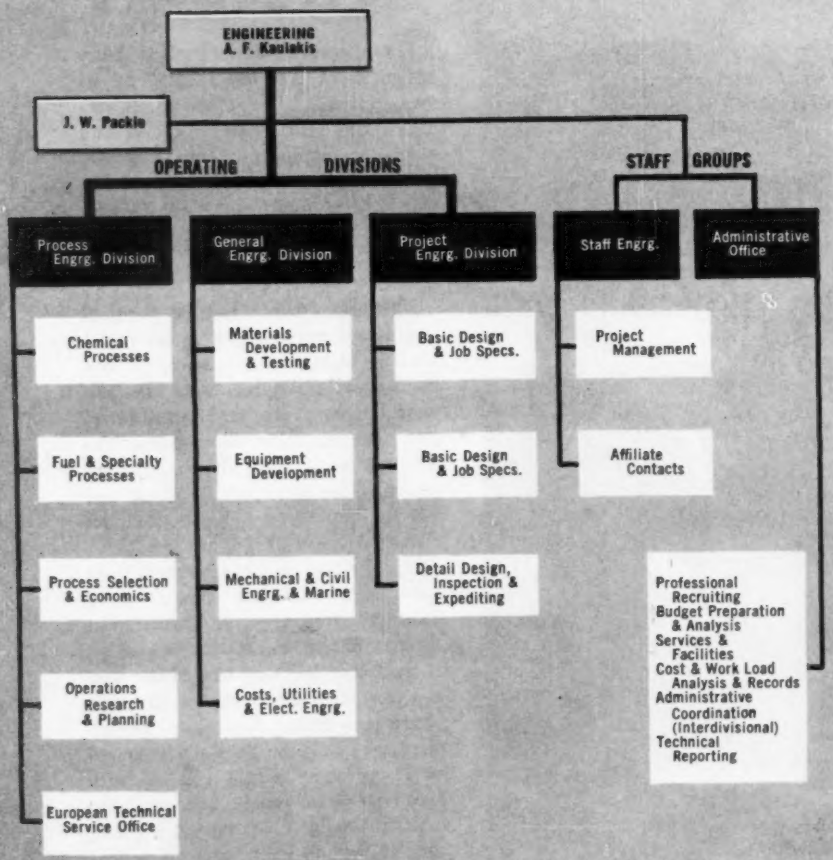
(1) Management must be personal and carry the initiative at all times. Says Kaulakis: "The trouble is that too many managers want to run their company like a general store; they line up their departments like products on a shelf, then wait complacently for some one to come and ask for something. This doesn't get results; it doesn't bring any life."

(2) The company environment must make each individual want to do a good job personally. In this respect "accountability" has become important at Esso. The best way to measure this, says Kaulakis, is to take a situation where something has gone wrong, then collect all the people who might be responsible. If you end up with a room full of people, accountability is poorly defined. On the other hand, each individual is encouraged to find the specific type of work that satisfies his best talents and gives him most satisfaction. According to Kaulakis, a man can't do this by himself, but must be helped by his company and its management.

(3) An engineering organization must provide both specialization and depth. There is no room for the old-fashioned type of engineer who tried to be responsible for all phases of a plant design. Tomorrow's engineer must apply himself to narrow fields and use imagination, concentrating on the fundamentals and work-horse jobs for computers and similar tools. Imagination of this sort has brought Esso a payoff in investment cost reductions amounting to over 5%/year the last 10 years. For this reason, off-the shelf designs are virtually never used for new plants.

Convincing People Personally: This all sounds good. But if a manager must limit himself to personal methods, how can he possibly put an involved program into effect? Answers Kaulakis: "The spirit needed for a dynamic organization can be com-

Esso Engineering's New Organization



How Responsibility Follows Authority

Project Design Steps	Role						Accountable for					
Crystallization Phase	Staff	Proj. Mgr.	Process	General	Project	Owner	Staff	Proj. Mgr.	Process	General	Project	Owner
Project initiation	△		□			■						●
Budget preparation and submittal	△		□	□		■	+					●
Site selection	△			□		■	+			○		●
Appropriation estimate	△			■			+			●		
Over-all schedule coordination	■	◥	◥	◥		◥	○					
Basic Engineering Phase												
Process planning	△		■		△	△	+		●			
Process design data	△		■		◥	△	+		●		○	
Site data	△			□	■	□	+			○	●	
Basic design	△		◥	◥	■	△	+		○	○	●	
Job specification	△			□	■	△				○	●	
Contractor-Construction Phase												
Contract route selection		■	□	□	□	◥		○				●
Procurement route selection		■		□	◥	◥		○				●
Detailed estimate		▲		■		▲				●		
Bid invitations		■				▲		●				
Bid review		■	◥	◥	◥	▲		●	○	○	○	
Contract award		■				◥		○				●

Key to Symbols in "Role"

- ■ Prime doer
- □ Supplies parts on request
- ◥ Supplies parts and keeps informed
- ▲ Must keep informed
- △ Receives information

Key to Symbols in "Accountable for"

- ● Decisions
- ○ Recommendations
- \+ Facilitating

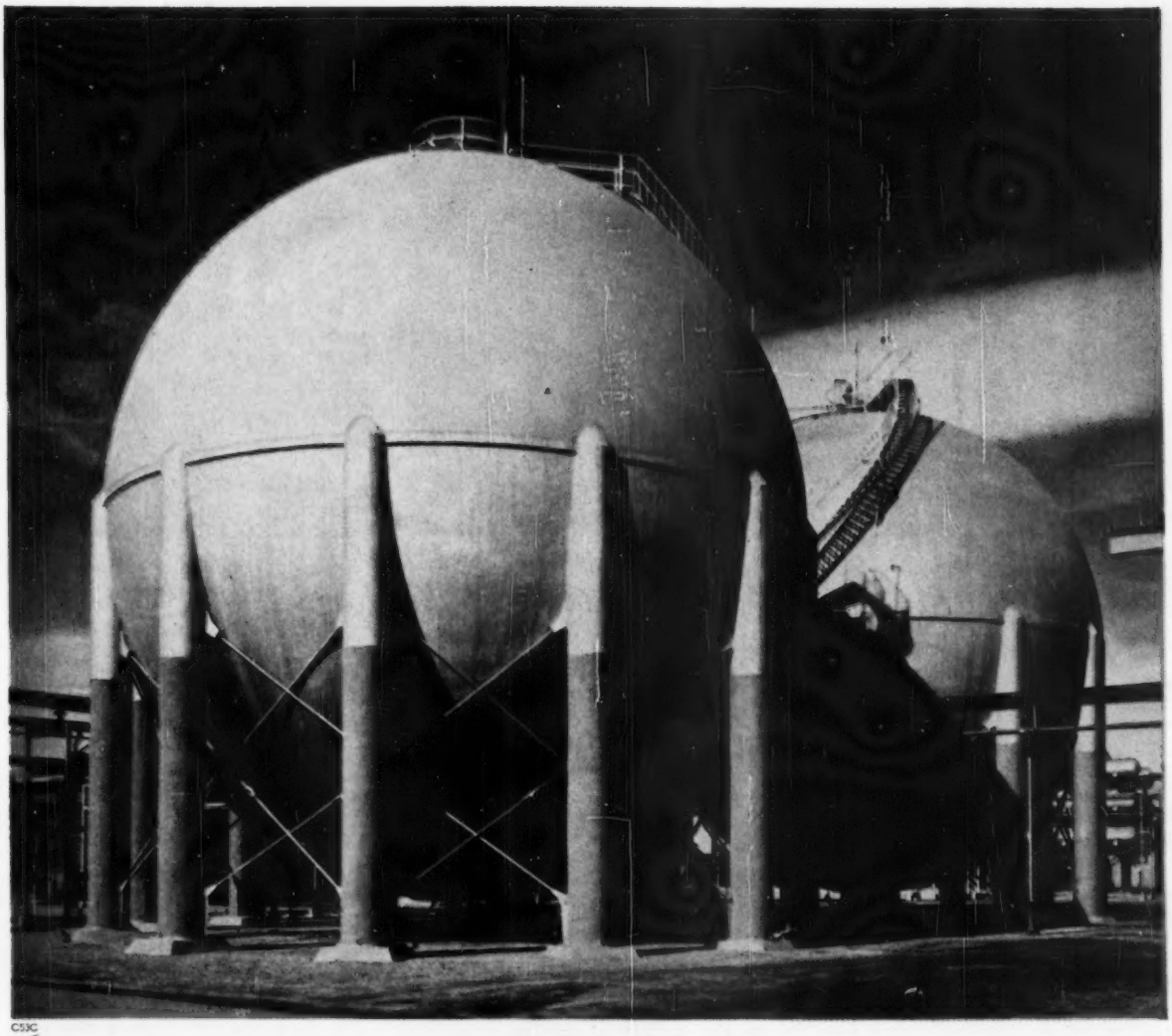
municated only on a day-to-day, man-to-man basis. When people are convinced that they have a leader who means business and has sound principles, his principles are followed somehow or other, no matter what his level."

Kaulakis joined Esso in '42 after graduating from MIT and working for a few years in Texas. He took part in the development of fluid catalytic cracking and other processes for which he holds 13 patents. In '54, he was appointed acting director of Esso Engineering's Petroleum Development Division. A year later he was named manager of employee relations for Esso Research and Engineering Co. and stayed in this position until '57, when he was named director of the Process Research Division. He continued in that job until this year, when he became acting manager of Esso Engineering.

Following his own principles, he does his convincing personally. He speaks forcefully, often and concisely about those subjects that touch on his work (see *CW, Aug. 6, '60, p. 66* for his views on evaluating researchers). Within Esso Engineering he sets an example by personally knowing the work and characteristics of every individual in the two managerial levels beneath his own. He believes there should never be a cutoff point between a manager and the men under his jurisdiction. When he wants to diagnose a technical situation, he joins the men doing the work in a conference, where every man's opinion carries equal weight until the point of decision.

Throughout all this Kaulakis operates by objectives. He establishes them by clear definitions, then as follow-up, he holds himself and each of his division managers accountable for obtaining them.

Imagination by Maturation: This individual approach goes far in building an atmosphere for Esso engineers to want to do a good job personally, but it is only a step in that direction. Key to personal interest at Esso is development. Says Kaulakis: "There isn't anything that can't be done better, or any individual who can't do better. We want people to mature professionally as fast as they can." He adds: the rate at which people mature on their jobs is determined



C53C

Twin Hortonspheres Store Anhydrous Ammonia

United States Steel Corporation's nitrogen products plant near Provo, Utah, produces chemical fertilizers and industrial acid.

Built at the site of U. S. Steel's Geneva Works, the chemical facility utilizes coke oven gas recovered from steelmaking process to produce anhydrous ammonia. In its liquid form, the product is stored at approximately four times atmospheric pressure in the twin Hortonspheres shown above. Designed, fabricated and erected by CB&I, each structure is 60 ft. in diameter and has a 2,100-ton capacity.

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by: (1) people themselves; (2) their relation with management; (3) whether or not their work is interesting; and (4) the facilities, procedures and methods available to help them.

Kaulakis holds his management team accountable for all of these. Division managers must interview each new engineer, and personally retain responsibility for his development. They are alert to each man's aptitudes; they help him follow these by assigning him to appropriate projects as these develop; and following up his development, they recommend salaries that recognize his difference in performance. Finally, the engineers are supplied with the latest tools for solving their trouble-shooting problems, carrying out their development programs and putting their project designs into effect.

In the last of these, project design, the problem of accountability stands out. Project engineering is typical. Unlike most of the engineering contractors, Esso Engineering believes that the project engineer is an administrative engineer, that it is illogical to hold him responsible for designs and specifications for which some other engineer was accountable. To overcome this and other confusions, Kaulakis analyzed the project design work in terms of decision making and put the results into the table (*p. 28*) relating authority (under "role") to responsibility (under "accountability"). A study of the table shows how they move together through the phases of project design. The engineering divisions (*shown at the top of the table*) are defined on the associated Esso Engineering organization table.

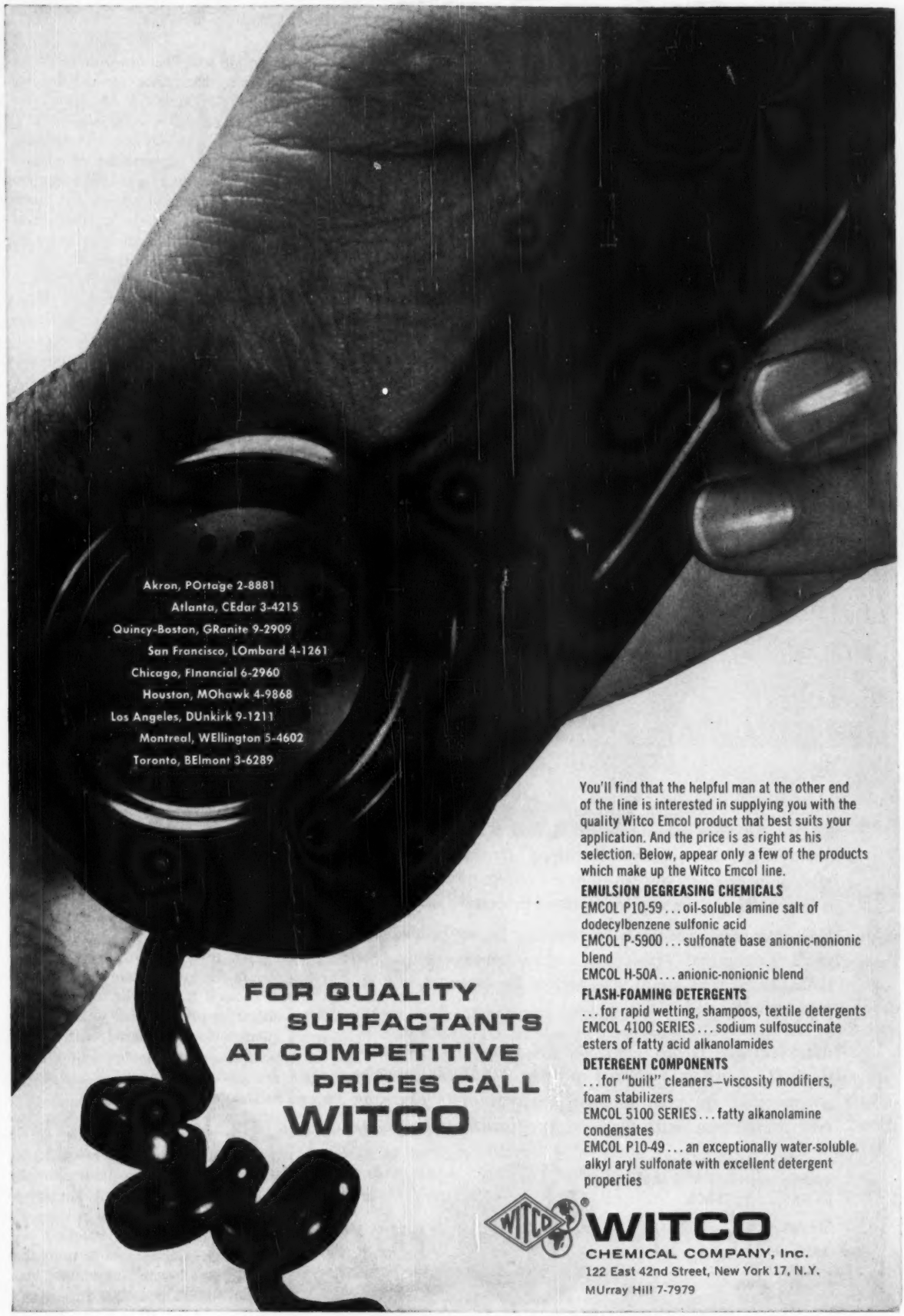
The organization table also gives some idea of what is meant at Esso by specialization. This can only be approximate, however, for Kaulakis believes that specialization should be as varied as engineering is complex. He cites dock facilities as an example: with the advent of the super tankers, Esso engineers have undertaken to redesign the classical docks with new imagination.

But: Although Kaulakis's management idea looks clear, consistent and enlightened, it makes one basic assumption that limits it to Esso Engineering as distinguished from many other companies. It assumes that all of its engineers are dedicated professionals with an interest in their work, which they put before everything else. Thus it applies to an organization where there is relatively little routine design and drafting work.

Application of standard scheduling estimates to Esso's $300-million work load in new plants shows that the 600 engineers working in and out of Esso's Florham Park center are an elite corps. Kaulakis's policy is set up for such a select group.

In general this indicates that about one-third of the group are occupied with basic design work on new projects at all times. This checks with the split-up of effort between trouble-shooting, new development, and project design.

However, Esso normally turns its



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basic job specifications over to an engineering contractor for the detailed design (*CW, June 4, p. 33*). This keeps busy about 1,000 men who have to work with skill and attention to detail, if not to the high degree of creative imagination that was given to the basic specification. Managing these men becomes, then, a separate problem that is not handled by the Esso Engineering organization.

Esso's Kaulakis has shown how to manage the engineering professional. It remains, however, for other companies to show how to manage the thousands of man-hours that go into routine project design work.

Undersea Terminals

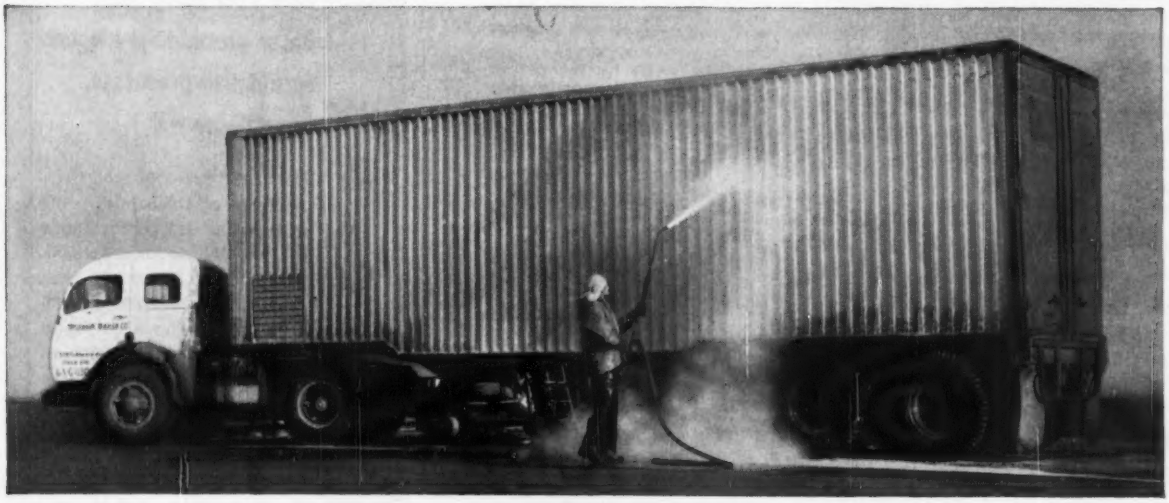
Engineers at Bethlehem Steel's Beaumont, Tex., shipyard have just sent to sea a novel solution of the problems of handling crude oil from offshore wells. Their plan may have application to many of the chemical process industries' bulk liquids transported by oceangoing tankers.

Bethlehem engineers have, in effect, replaced shore terminal storage tanks with an ocean terminal that has storage tanks resting on the ocean floor. The first unit was completed last month and has been started toward its site 35 miles off the Louisiana coast in the Gulf of Mexico. The tank is 112x92 ft., is 10 ft. deep. It will be buried in the ocean bed with its top flush with the floor of the Gulf, under 25 ft. of water.

Due to hurricane Ethel, actual installation of the terminal was held up until last week. Now, it has been secured in the Eugene Island area off Morgan City, La.

Four towers, each 18 ft. in diameter in the lower section and tapered down to 8 ft. near the top, will hold operating platforms as well as living quarters for 10 men. During operation, oil will be pumped in through the towers, forcing down seawater ballast in the storage tank, or seawater will be pumped into the tank beneath the oil, displacing it up through the towers. Oil will come from sea-based wells about one mile away; it will be unloaded into oceangoing tankers, which can pull up adjacent to the towers. Bethlehem says this design is applicable to units that can store as much as 1 million bbls. in water as deep as 200 ft.

From washing delicate china . . . to heavy-duty industrial clean-ups



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Washington
Newsletter

CHEMICAL WEEK
October 1, 1960

A fight over who should deal with water-pollution problems is shaping up for the next session of Congress. Rep. John Blatnik (D., Minn.), chairman of the subcommittee that deals with pollution projects, will introduce legislation to take pollution control completely out of the Public Health Service and give it agency status directly under the Health, Education & Welfare Secretary—like that of the Food & Drug Administration.

Because current water-pollution control effort is concerned with a number of drinking water projects, medical doctors have the final say on who gets research grants; thus the program is considered part of public health.

But Blatnik feels that keying the program to safe drinking water falls far short of his real concern: conservation and reuse of natural water supplies, which are rapidly becoming inadequate for industrial and community needs. In fact, he feels, it might not be a bad idea to take water pollution out of HEW and put it under the Interior Dept.'s jurisdiction.

Whether he succeeds or not, a reshuffling of priorities is likely to occur in the Public Health Service. The Administration is backing a reorganization plan that would create a new bureau of environmental health. This bureau would have four divisions—water pollution, air pollution, radiological health, and industrial hygiene. On each of these problems the engineering and medical functions would be brought together in one office. Surgeon General Leroy Burney feels that this would provide a coordinated attack on environmental contamination. Engineers and doctors would work together on ways of determining biological effects of contamination and mechanical ways of controlling it.

HEW officials say key congressmen agreed to such a reorganization this year, but time did not permit putting it through in the special August session. They expect quick action next year. Blatnik could go along with the bureau of environmental health setup and still seek to set out water pollution as a separate agency. His point: water-pollution control is a $50-million/year program involving 400 federal employees, yet it has no higher bureaucratic status than air pollution, which is a $1-million research program. Also, it is no longer a medical problem—it is a problem in national resources.

•

External tariff negotiations between Europe's two trade blocs will be tough and touchy at GATT sessions in Geneva this fall. The European Common Market proposes to cut its common tariff to outside nations 20% and expects the British-led European Free Trade Assn. to match the cut. However, EFTA is dragging its heels, and some officials

are hinting that if EFTA flatly refuses to make a cut, the Common Market (European Economic Community) offer will be shelved.

The U.S. stands to lose the most if tariff-cutting talks break down. The lowest possible external rates acceptable to both EEC and EFTA would benefit U.S. exports significantly. What U.S. officials fear most is that EEC and EFTA may revert to talking preferential "swaps" of specific tariff cuts between themselves, with the result that the U.S. and other outside nations would be discriminated against.

EEC and EFTA have yet to begin actual negotiations. Washington is hoping the threat of Soviet bloc economic strides will persuade Britain to swing behind the mutual 20% cut in external rates to all nations under GATT.

•

Plans to build a huge aluminum smelter on Ghana's Volta River are hitting one snag after another. The big controversy centers around the electric power rate the Ghana government proposes to charge an international consortium of aluminum producers led by Kaiser Industries Corp.

Ghana has received pledges of aid from the U.S., Britain, and the World Bank to help build electric power facilities to supply the smelter and other industrial projects. But after first quoting a power rate the consortium regarded as too high (4.5 mills/kilowatt hour), Ghana has now dropped this proposed rate so low (2.5 mills) that the World Bank has objected.

What may lead to a final compromise approval of the project soon, however, is Soviet Russia's offer to build the power and aluminum facilities if the West does not. U.S. officials consider the project vital to Western political and economic influence in Africa.

•

Drug manufacturers are raising objections to an FDA proposal that warnings on the hazards or adverse side effects of drugs be included in every package of prescription drugs.

Their objection: What good does it do the doctor if all that information is in the package at the pharmacists? They and the American Medical Assn. have asked for more time to file comments.

The pharmaceutical firms point out that the problem is to get the information into the doctors' offices. This could be left up to the manufacturers. Or an organization could be created, either private or governmental, to assemble information from companies and distribute it to doctors in a handy reference form. They favor a private organization, something like that which publishes the *U.S. Pharmacopoeia.*

Another consideration: FDA's proposal presents a packaging problem, since some of the brochures would have 20-30 pages if complete information were given.

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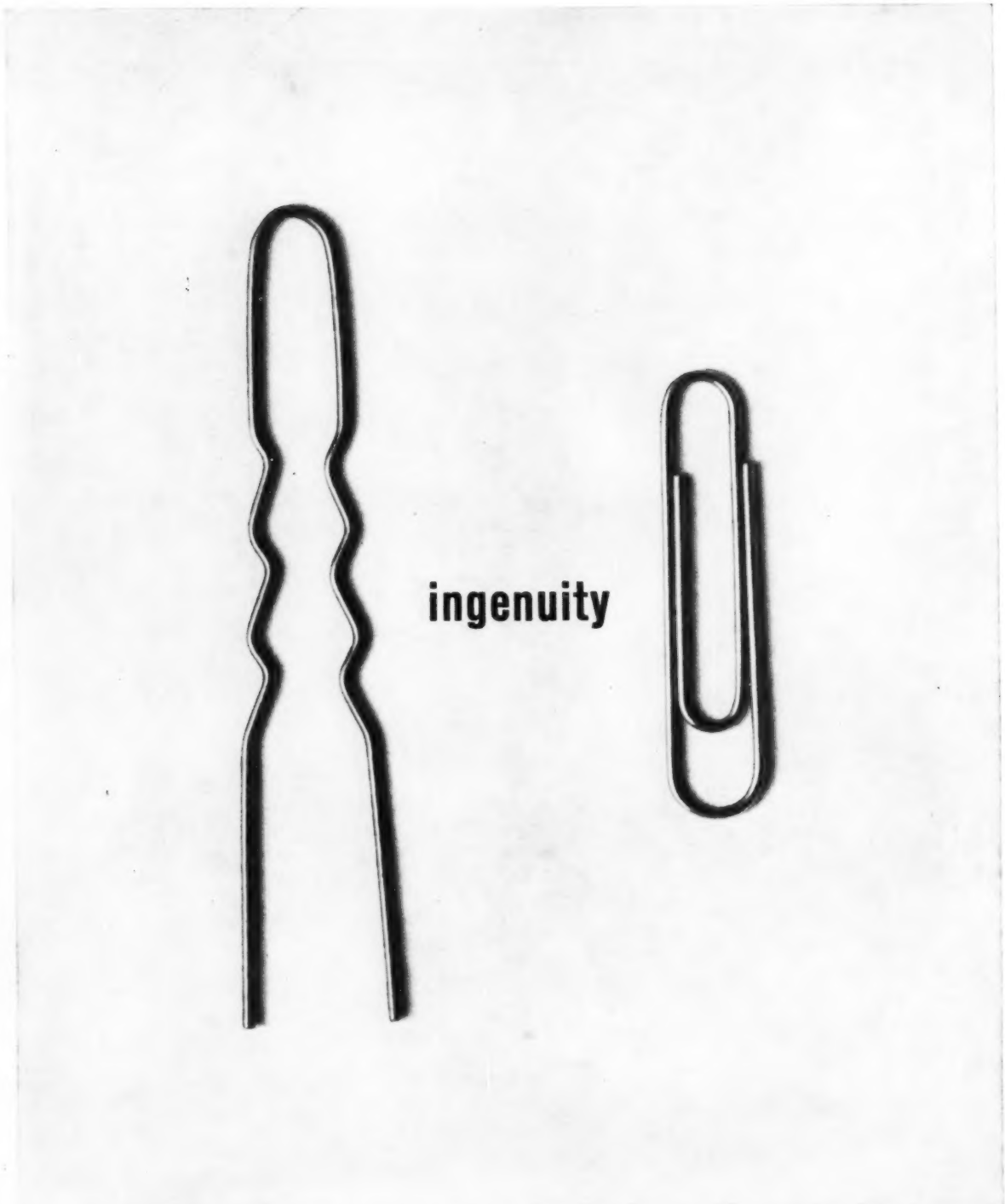

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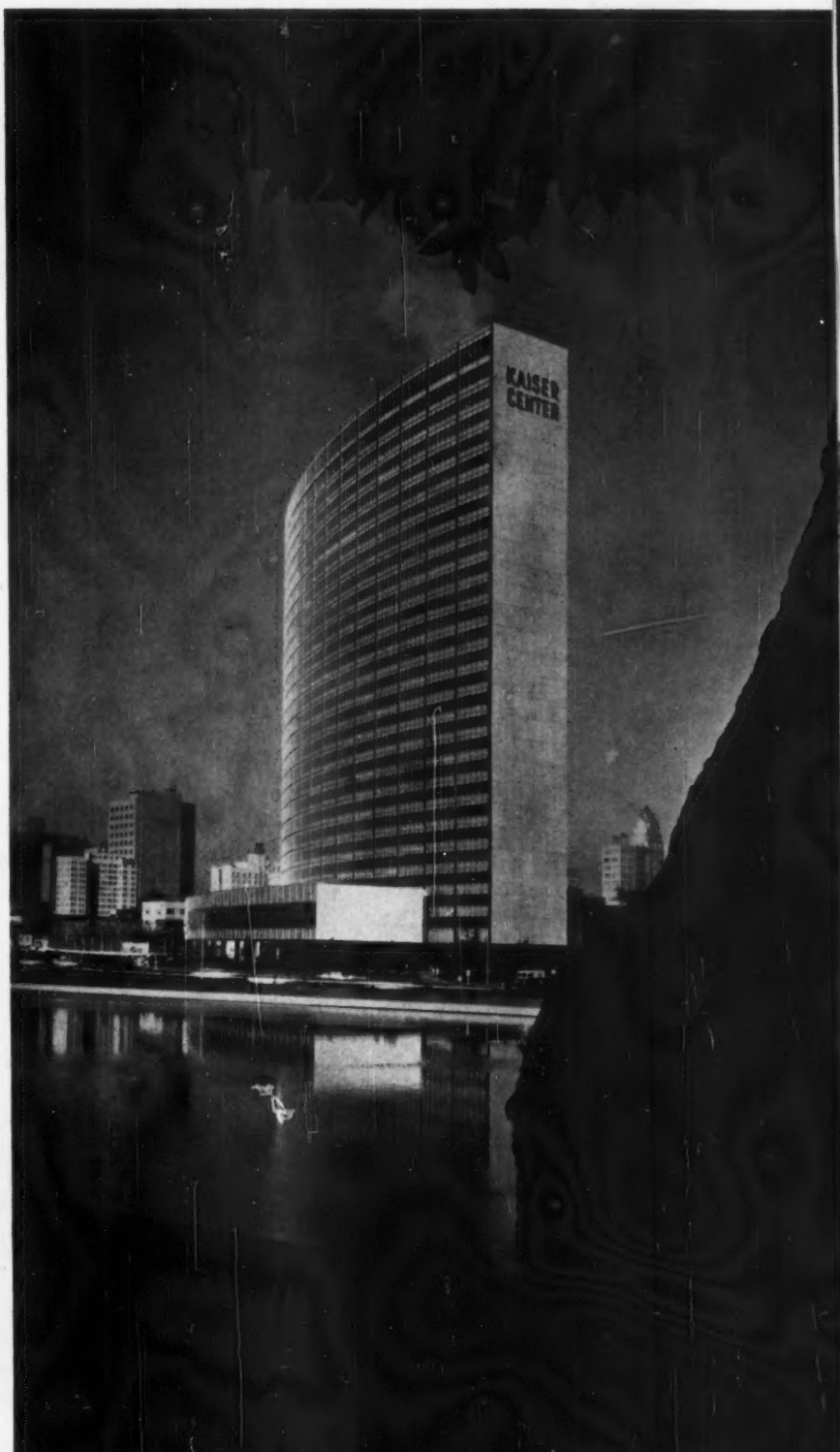
San Francisco's East Bay Paces West's CPI

Stretching in two directions from the world headquarters at Oakland, Calif., of the Kaiser Industries (right) —parent of Kaiser Aluminum and Chemical Corp.—is a boomerang-shaped area that is rapidly becoming a center for the California operations of many chemical companies. Hugging the bayside edges of Alameda and Contra Costa counties, the area is known to local residents as the East Bay.

From the marshes at the base of the great bay (*see p. 42*), to Oakland and Berkeley, through the giant Standard Oil of California complex in Richmond, to the Shell Oil-Shell Chemical combination at Martinez, and all the way up to the paper mills on the San Joaquin River at Antioch, runs an 80-mile-long stretch of chemical industry development.

Bounded on the West and North by the bay, the two counties, with a combined population of over 1.3 million, have long since tied their major chemical industry potential to deepwater shipping, overseas markets, and a booming specialties business that's kept in step with a population growth rate unsurpassed anywhere else in a state long famous for population growth. Although for many years the southern California growth rate has been one of the steepest in the country, in '58 northern California's growth increased sharply, and many experts now believe the rate in the North is outstripping the South.

Chemical Factor: It's this fast growth of a consumer population that may account for the booming specialties chemicals development in the area. Although there are no available reliable figures on production, it's indicative of the industry's growth that shipments of chemical specialties through the terminal facilities of Berkeley, Oakland, Richmond, Martinez and Pittsburg have increased 132%, to 47,987 short tons, in the period from '55 to '59. At the same time, shipments of soaps and toilet preparations have increased 45.5%, to 578 tons in '59. Another category of



Kaiser's world headquarters highlights East Bay's chemical strip.

Deepwater facilities, such as Standard Oil's piers, attract CPI to West.

chemical production showing increased shipments is fertilizers. Total chemical shipments, excluding petroleum products, have risen 38.5% to 288,876 tons in the five-year period. Shipments of petroleum products have dropped a whopping 75%, mainly due, refinery managers agree, to increased competition and depressed conditions in the petroleum industry.

Population Factor: Those who expect growth in the chemical business in the East Bay area place much weight on predictions for population growth. They cite a study completed this summer for the U.S. Army Corps of Engineers to determine water and shipping needs in the area over the next half century.

Projected growth for Contra Costa County alone calls for a doubling of the population in 25 years and an eventual expansion to over 2 million by the year 2020. Alameda County, with a present population approaching 1 million, should almost double in less than 50 years and grow to 2.8 million by 2020.

These population figures, when compared with the eventual growth of the San Francisco Bay area, point the way to a new and actually exploding market situation. The '60 census for the 13 bay region counties is 4.5 million. Estimates indicate a doubling in 30 years and a grand total of 14.4 million by 2020.

This extremely rapid, and previously unpredicted, change presents a dazzling picture to chemical manufacturers and calls for revisions in earlier market predictions. In fact, the Engineers' report picks the chemical industry, along with business machines and electronics, food products, packaging and containers, and steel, as major area growth industries in the next 10 to 15 years. The report cites refineries, petrochemicals plants, and "plants to produce fertilizers, sulfuric acid, plastics, cement, and compressed and industrial gases" as important possibilities for bay area development.

The report concludes that initial growth is expected to be heavier in the South Bay counties, such as Contra Costa and Alameda, than in the North Bay in the immediate future. Land reclamation projects are expected to bring considerable new area into usage.

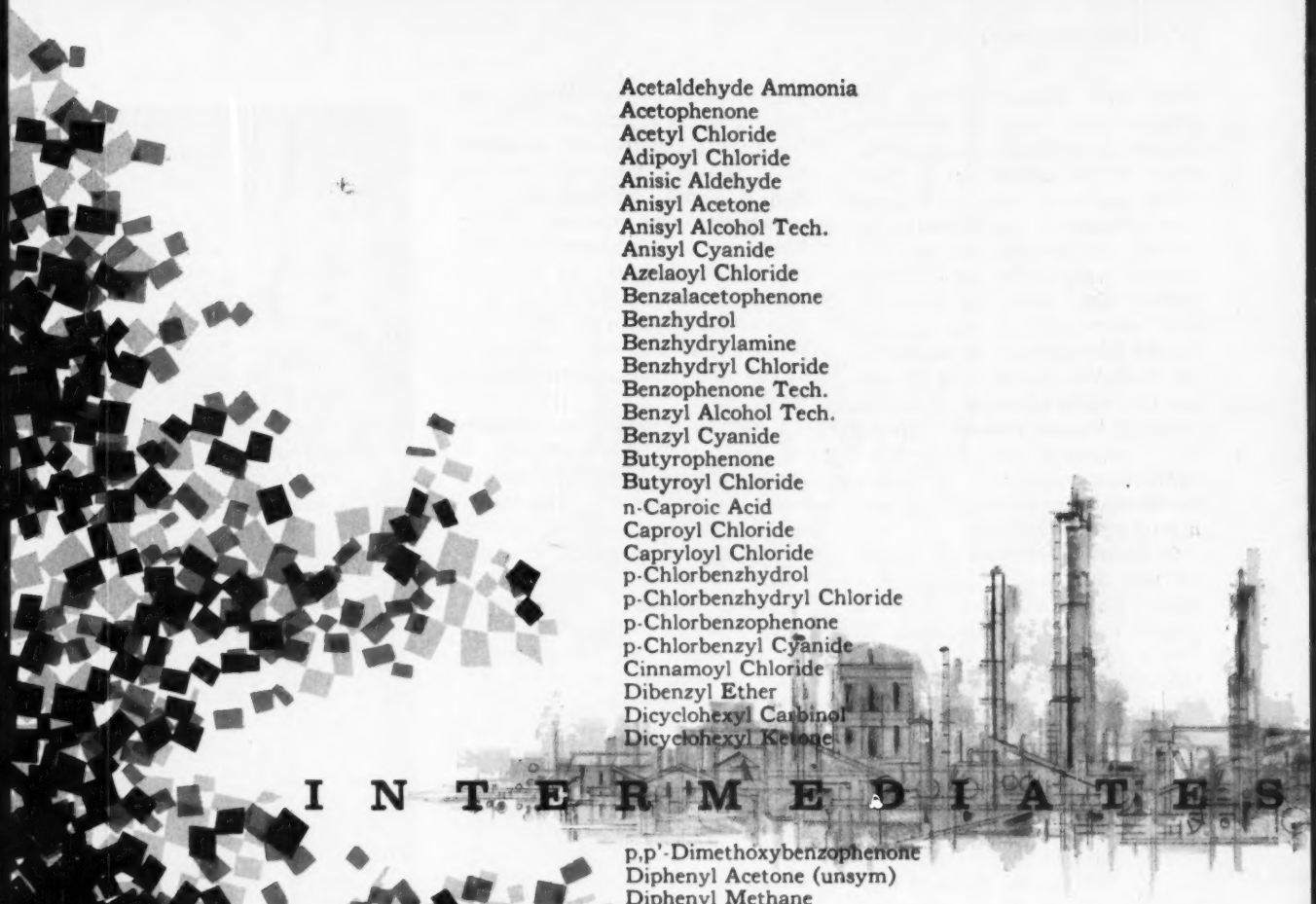
The more crowded and older industrial areas in the two major East Bay cities of Oakland and Berkeley, plus the industrial city of Emeryville, now account for the lion's share of the lower chemical strip's consumer-oriented chemical production.

On the bayside strip are eight firms in the pharmaceutical preparations business; nine making soap and glycerin; 20 making cleaning and polishing preparations; 32 producing paints, varnishes, lacquers, and enamels; six in the printing ink business; eight manufacturing perfumes, cosmetics, and other toilet articles; and 10 in the insecticide and fungicide business.

The predominant position of specialty chemicals producers in this area is due to heavy urban concentration in the 13-county bay region and a 7.5-million-persons market in the 48 northern California counties (as far south as Fresno), some of Nevada (Reno specialities producers have made some inroads here) and as far north as the southern section of Oregon (Portland specialties makers are of increasing importance in this fringe area).

Change at Richmond: Moving

Chemical-handling equipment and storage tanks mark Parr-Richmond terminal.



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p-Chlorbenzophenone
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Cinnamoyl Chloride
Dibenzyl Ether
Dicyclohexyl Carbinol
Dicyclohexyl Ketone
p,p'-Dimethoxybenzophenone
Diphenyl Acetone (unsym)
Diphenyl Methane
Ethyl Formate Tech.
Ethyl Phenylacetate
beta Ionone
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Isobutyroyl Chloride
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Isovaleroyl Chloride
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Palmitoyl Chloride
Pelargonyl Chloride
Phenylacetic Acid
Phenylacetone
Phenylacetyl Chloride
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north from Alameda County into Contra Costa, from Richmond to Antioch, a profound change in the nature of the industry occurs. Richmond signals the start of a major chemical complex that includes Atlas Powder (the company last week announced it would shut down its Giant powder works there, but hasn't decided what it will do with the site), Stauffer Chemical and its subsidiaries, Air Reduction Pacific, U.S. Peroxygen Co., Allied Chemical, Food Machinery's Niagara Chemical Division and a number of other large-volume chemical manufacturers. At least a half-dozen major expansions are now in progress among them.

So active is Richmond as a chemical port that over a quarter of a million tons of chemicals and allied products passed out of this port in '59. This is in contrast with the Berkeley-Oakland port, which shipped only half that tonnage of chemical products last year.

With extremely heavy activity on the part of the shipping industry to keep pace with increasing CPI exports, Richmond is expected soon to develop into one of the major gateways to Far Eastern chemical markets. Bay area executives are keeping a sharp eye cocked on the rapidly expanding Japanese chemical industry and what effects this will have on imports, exports and expansions. Further along the strip, M & R Services of Pittsburg, a transportation company, is spearheading impressive plans to improve shipping facilities, particularly at the old U.S. Army Camp Stoneman dock situated on the outskirts of Pittsburg on the highway to Antioch. M & R has developed a substantial terminal and shipping business at the Stoneman dock, in which chemicals play no little part.

Another major shipping firm, Parr-Richmond Terminal Co., based in Richmond but serving the entire San Francisco Bay area, estimates that about 50% of its general cargo and 30% of its bulk cargo relate to chemical commodities. A tank farm located at its Terminal No. 3 was constructed expressly to receive, store and deliver liquid chemicals to and from ocean vessels, trucks and rails.

Other Transportation: Besides excellent shipping facilities, the East Bay counts on the Western terminals of three major railroads (Southern Pacific, Santa Fe, and Western Pacific) as well as more than 100 trucking lines. Many chemical producers have developed their own trucking fleets to market their products.

Outlook: Most observers of the West Coast chemical scene agree that the East Bay contains the necessary natural ingredients to attract new chemical development — land, transportation facilities, water and power, as well as favorable industrial zoning laws.

Contra Costa County boasts a Zoning Planning Commission with a reputation for understanding industry's needs. In this county, for example, industrial zones cannot be rezoned for residential development but a residential district can be rezoned for industrial purposes.

According to the latest census, the county contains 34 CPI plants having a total assessed tax valuation of over $150 million. These 34 plants employ 14,000 workers or approximately half oil refineries (Standard of California, Tidewater, Union, Shell).

Industrial development groups in the area also cite as advantages, the close proximity to markets and sources of basic materials in the four oil refineries (Standard of Calif., Tidewater, Union, Shell).

Eye on Research: The area is pushing a movement to attract industries in the research and development field. A great many laboratories have congregated near Stanford University, located on the opposite side of the bay at Palo Alto (*CW, May 19, '56, p. 31*). Now Contra Costa County and area industry would like to see another concentration built up around the University of California at Berkeley. In addition, the county would hope to have small chemical firms move into the area.

Future: The rapidly expanding population of the West Coast and northern California is proving to be a beckoning finger to CPI manufacturers of consumer-oriented chemicals. Too, local refineries are anxious to pick up increased markets for their products. In addition, as Far Eastern markets develop, the splendid shipping facilities of San Francisco's bays should become more and more heavily traveled roadways to the Orient. Together these factors spell a glowing future for development in the East Bay region.

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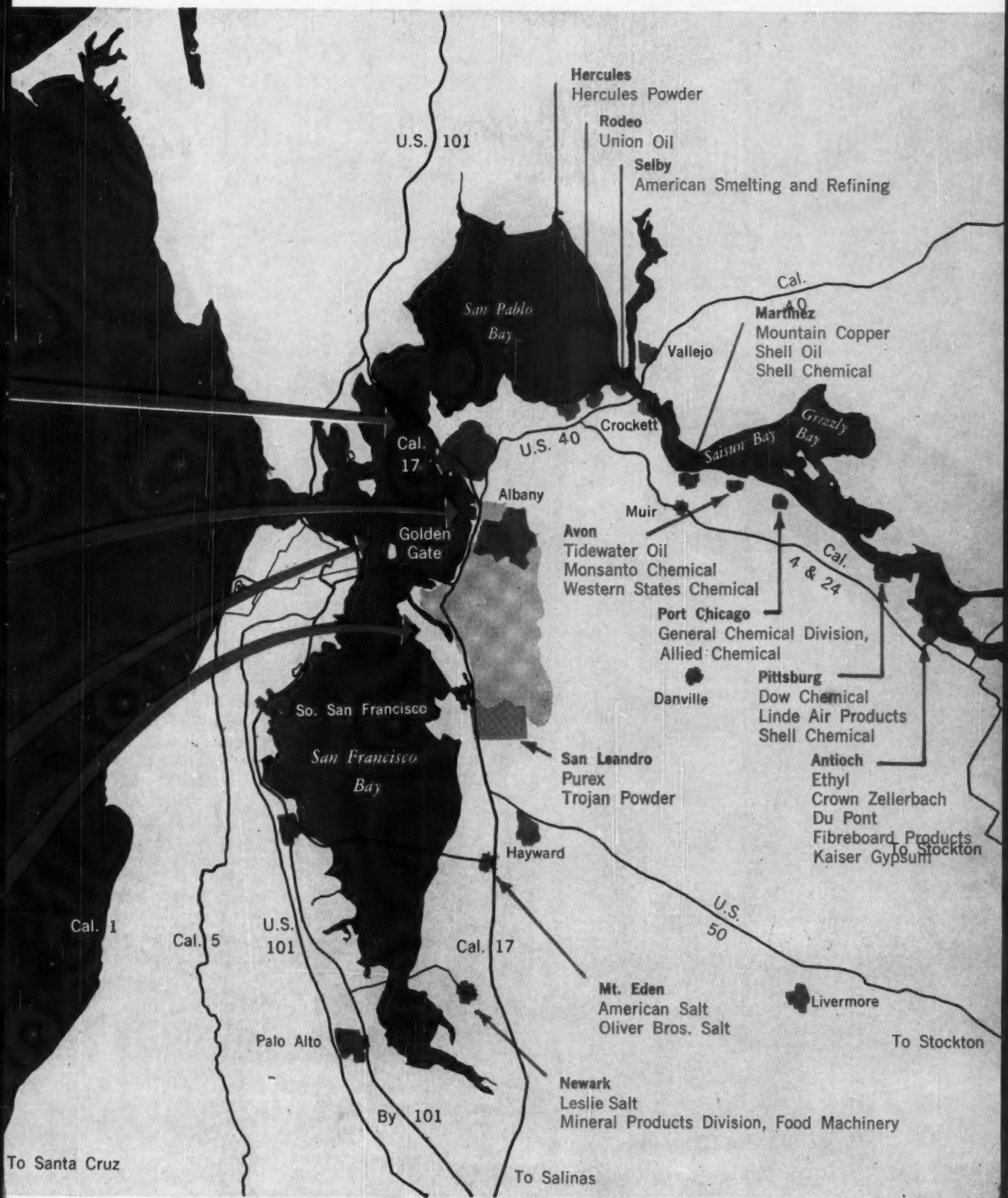
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License Leader

Kentucky took positive steps this week towards becoming the first state permitted to license use of certain nuclear materials.

The state's radiation-control program was submitted to Atomic Energy Commission officials this week. If it qualifies, the state will get the rights to okay the use and possession (within its borders) of nuclear byproduct materials (such as isotopes), source material (uranium) and special nuclear materials.

Industry officials believe that in many cases it will be easier and quicker to deal with state authorities than with Washington. For this reason, some states have been working hard on programs that AEC will approve, and which will help them to get an early start in attracting nuclear industry.

That Kentucky was the first state to offer a program for AEC approval came as something of a surprise to the industry. New York, California and Texas have publicized their efforts and many industry observers were led to believe one of them would be first.

Polyfoam Fight

General Tire & Rubber Co. (Akron, O.) has maintained exclusive rights to use the trademark Polyfoam, as the result of a judgment in U.S. district court in Los Angeles. Judge Ross Rizley has ordered Polyfoam Products Co. not to use the word "polyfoam" or any word "confusingly similar" in connection with products or company name. Polyfoam is used by General for its polyurethane foam used for cushioning in furniture, aircraft and automobiles.

LABOR

Oil Pattern: Management eyes in the oil industry this week are turned toward Sinclair Oil Corp., which is the first oil company to begin negotiations with the Oil, Chemical & Atomic Workers Union. Sinclair is the only oil company with which OCAW has a company-wide master contract. It's thought by many that the settlement reached by Sinclair will be a major pattern-setter for other settlements. Two years ago Sinclair settled for a wage increase of 5%, the average increase that finally swept the industry. This year, reportedly, oil companies plan to hold out for no increases, pleading lackluster business.

Meanwhile, at Cosden Petroleum, division of W. R. Grace & Co., management is pleased that members of Local 826, International Union of Operating Engineers, have voted not to reopen their contract this year in view of the difficult conditions prevailing in the oil industry. Their agreements become effective Nov. 1 each year and remain in effect through Oct. 31 of the following year. They are automatically renewed for consecutive periods of one year unless the union or management wants to change or end the contract.

•

JeffChem Settlement: The latest strike at Jefferson Chemical Co.'s Port Neches, Tex., plant appears to be settled. Background: for the third time this year, members of Local 4/228, OCAW, had gone on strike against the company, this time mainly over the dismissal of an employee who allegedly attacked the driver of a truck of a common carrier who had crossed the union's picket line in a previous strike. While JeffChem offered to submit the matter to arbitration under terms of its expired contract, the union countered that since the employee would be tried in a civil court on charges of assault, the arbitration would put the man in "double jeopardy." Final agreement: company and union will abide by the civil court decision if handed down within six months; after that time, the case would go to arbitration.

KEY CHANGES

Felix A. Buskey to chairman of the board and **Guy C. Bates** to president, Bates Chemical Co. (Lansdowne, Pa.).

Owen Cooper to president, Mississippi Chemical Corp. (Yazoo City, Miss.).

F. Leonard Bryant to executive vice-president and board of directors, **Thomas F. Willers** and **Werner P. Gullander** to board of directors, Hooker Chemical Corp. (Niagara Falls, N.Y.).

P. W. Perdriau to president, Industrial Products Co., division of B. F. Goodrich (Akron).

Ross V. Sayers to vice-president, George A. Breon & Co., division of Sterling Drug, Inc. (New York).

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RESEARCH

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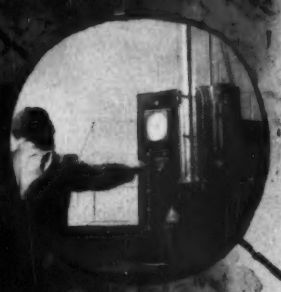

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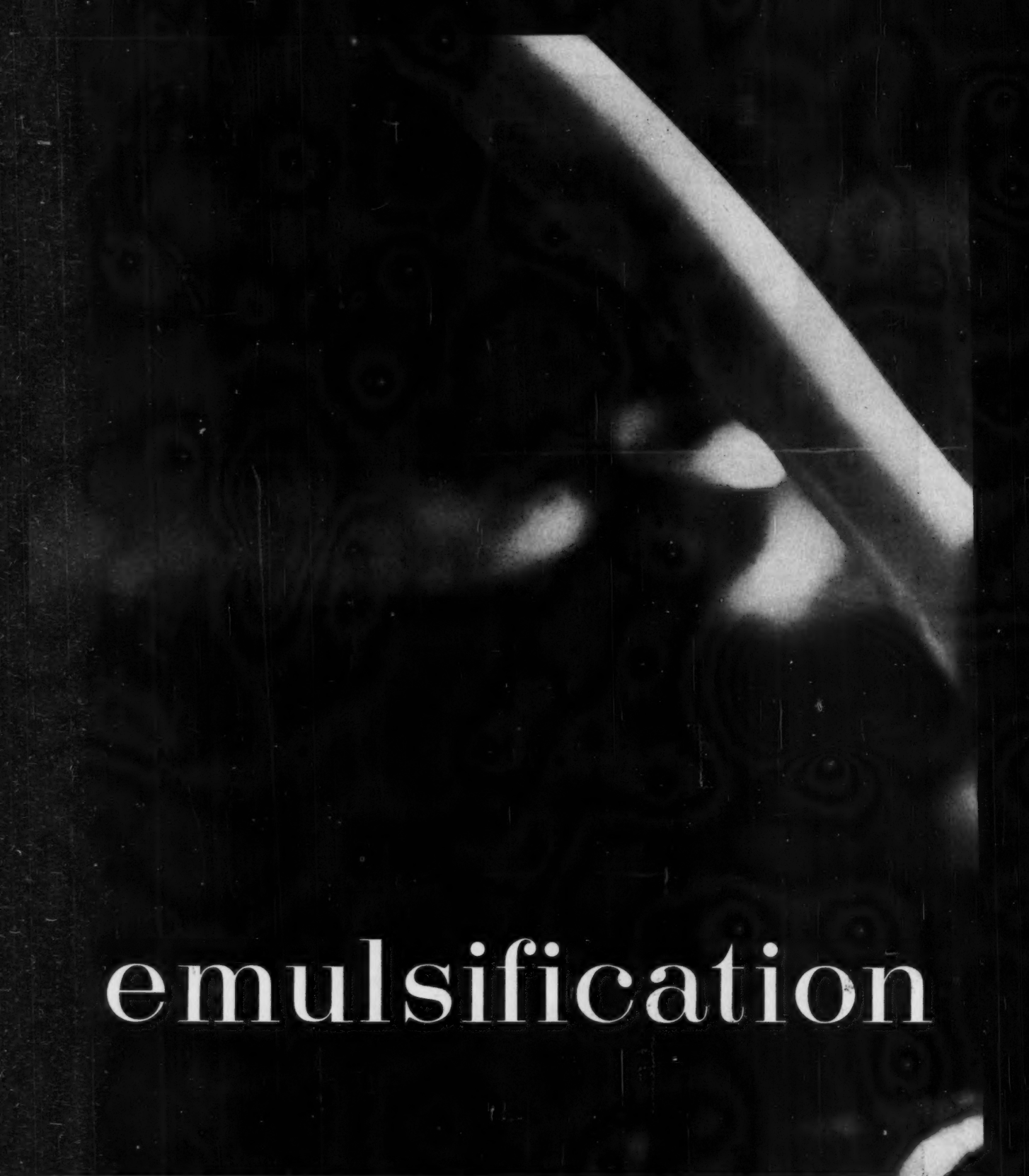

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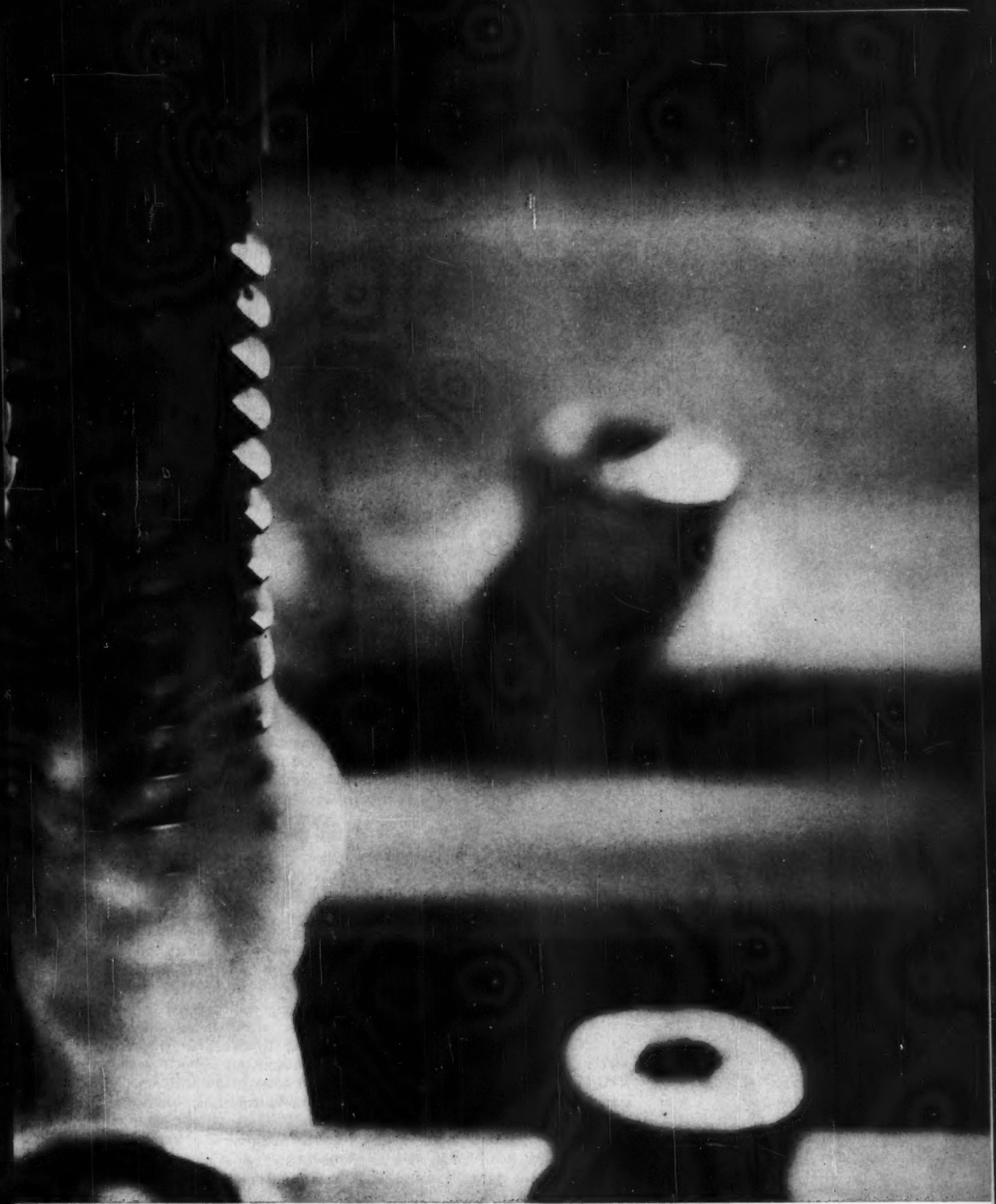

improving lubricity, speeding the
Atlas puts a lot of technological
Dept. HG for more information.

ATLAS
POWDER COMPANY
Wilmington 99, Delaware

Rug Cleaners on FTC Carpet

The three biggest makers of rug cleaning specialties have just had the rug pulled from under them by the Federal Trade Commission. In a formal complaint, the FTC has charged Bissell, Inc. (Grand Rapids, Mich.), Glamorene, Inc. (Clifton, N.J.), and E. R. Wagner Manufacturing Co. (Milwaukee) and its subsidiary Glamur Products, Inc. (Syracuse, N.Y.) with misleading claims for their rug cleaning shampoos and applicators.

The charges leveled at each of the companies are not identical. In general, however, the crux of FTC's complaint is that the leaders in the $20-million carpet cleaning compound market (*CW, April 4, '59, p. 57*) have been telling the housewife she can give her rug a do-it-yourself treatment with their products equal to a professional job.

Can the housewife clean her carpet as well as the professional? FTC says no.

The crackdown by the FTC has been noted with considerable pleasure by professional rug cleaning companies, whose business has been affected by the growing trend to home rug cleaning. They have been calling for some sort of action for several years.

Each of the three companies involved, which have until the first week in November to answer charges, told *CW* it will contest the moves. Action will be on an individual basis, however.

Big Target: So far, the government's complaints have been limited to companies making, marketing, and advertising a combination of rug cleaning applicators and shampoos—a business with total retail sales of about $40 million/year.

In the case of Bissell, the FTC is labeling as "false, misleading, and deceptive" the claims that the company's Shampoo Master applicator is as effective as a professional carpet cleaner, will remove all stains that a professional can, costs but one-tenth of a professional cleaning, will clean a rug twice as clean as any other rug cleaner, and will clean a rug merely by wiping on the shampoo and letting it dry.

The FTC is charging Glamorene and Wagner with making advertising claims that aren't true: that their products will clean as well as a professional, and stating that a rug can be cleaned by spreading their shampoo over it.

Professional Pressure: The National Institute of Rug Cleaners (Washington, D.C.), with membership of 650 professional rug cleaning companies, says it has been working with the FTC for several years to get a formal complaint issued. Its contention is that the inexperienced housewife cannot do a professional cleaning job with a wet shampoo, that its member companies often must be called in to rectify mistakes.

Trio to Fight: Bissell, Glamorene, and Wagner are now in the midst of preparing formal answers to the complaints. Each indicates it feels the charges are untrue, that it has not been giving the public a false notion about the effectiveness of its shampoo dispensers, and that the matter will be settled in their favor.

Bissell is regarded as the first major company to introduce (in Jan. '58) a dispenser that could be filled with rug cleaning detergent. Within a year, both Glamorene, which had been marketing an applicator for institutional use, and Wagner joined the field.

Bissell has sold an estimated 5 million applicators. And the company figures that 96% of its dispenser customers will use its Bissell shampoo for the life of the machine—pointing up how important it is to sell a dispenser if you want to sell a rug shampoo.

But this technique may not work if the government wins its case. And since the bulk of the rug cleaning compounds are to housewives (the institutional market is around 5% of the business) it's obvious that any restriction placed on advertisements beamed at the do-it-yourselfer could seriously affect sales.

Though it might appear that the government suit comes at a low sales period (charges must be answered by November) it doesn't work out that way. Although sales of these compounds are around 15% higher in the spring than during the rest of the year, it's becoming more and more of a year-round business. The trend to lighter rugs, for instance, has necessitated more frequent rug cleaning during the winter months.

Raw-material makers that could be affected by any decline in sales of rug cleaning compounds are those furnishing nonionic and anionic detergents, dyes, mildew preventives and moth preventives. Other chemical markets that stand to be affected would be those for trichloroethylene, carbon tetrachloride, bentonite, and coconut oil.

The rising curve of carpet sales in the U.S. (it's growing around 5% each year) and the fact that around 80% of these new carpets go into homes gives the carpet cleaner makers good cause to complain of FTC's action. The hearings in November should result in wall-to-wall complaints from these marketers.

why chemical companies are taking a closer look at DELHI-TAYLOR

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- Strategically located petrochemical terminals add to our delivery advantages.
- Rigid quality control and testing procedures assure highest purity products.
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PROPERTY DATA

MOLECULAR WEIGHT . . . 64.06
SPECIFIC GRAVITY
Liquid: Water = 1 @ 0°C (32°F) . . . 1.434
Gas: Air = 1 @ 0°C & 760 mm . . . 2.2636
MELTING POINT . . (—103.9°F) . . —75.5°C
BOILING POINT . . . (14°F) . . . —10.0°C
REFRACTIVE INDEX
Liquid: (I.C.T. 1,107) . . n20°/D(68°F) . . 1.410
Gas: (Mellor, J. W. Vol. X, 197) . . . n15°/D (59°F) . . . 1.000686

ANSUL CHEMICAL COMPANY, MARINETTE, WISCONSIN ● INDUSTRIAL CHEMICALS ✱ REFRIGERATION PRODUCTS ● FIRE FIGHTING EQUIPMENT

Big Splash in Starch

Lestoil Products, Inc. (Holyoke, Mass.) will test-market Lestoil's Instant Spray Starch this week in Boston and Providence. It is the first in an expanded line of household products promised by the former Adell Chemical Co. when it sold out to Standard International Corp. last spring (*CW, April 9, p. 91*).

The debut of the aerosol starch will mark the company's first entry into the aerosol field, and its third consumer product. Others are the pioneering "all-purpose" liquid detergent, Lestoil, and a dry bleach, Lestare, which is packaged in premeasured, water-soluble packets.

The new item will be "fair traded" at 79¢/16-oz. can. Initial promotion in Boston and Providence will be via newspapers and television. The company is offering a 10¢ discount coupon in its newspaper ads. Tentative plans are for wider distribution of the starch in early '61.

A natural starch, which must be reapplied after each washing, the product can be sprayed on either wet or dry clothing, and variations in degree of "starchiness" can be regulated by the user.

Lestoil hopes to sell its spray starch to the householders who never used starch before because they felt it hard or messy to mix or apply.

Main emphasis will be on ease of application. But Lestoil also says its product can be used to freshen up wilted garments between washings, and it is reaching for a market among valet and dress shops by suggesting the starch be used to restore appearance of just-unpacked garments.

Fruit Chemical Exports

U.S. manufacturers of diphenyl, paraffin wax, and food colors and other postharvest chemicals used on fruit got some advice this week on how to overcome European opposition to incorporation of their products in or on fruit exported to Europe. Dr. A. M. Boyce, director of the University of California's Citrus Experiment Station, outlined to Washington officials some positive steps he feels can be taken to minimize the effects of recently enacted European restrictions on these chemicals. Among his recommendations:

- Station an expert on fruit chemicals in Europe for two years. As an agent of the Foreign Agricultural Service or other U.S. Dept. of Agriculture, he would provide U.S.-developed information to countries drawing up regulations, help avert unduly restrictive clauses.
- Form a committee representing all U.S. fruit exporters.
- Have the FAS make a sustained effort through U.S. embassies to obtain relief from present restrictions.
- Have the USDA bring to the U.S. a team of European scientists concerned with regulation of foodstuff chemicals, show them the research that's been done here.

Boyce, pointing out that the European Economic Community may ultimately standardize residue tolerances for all foodstuff chemicals on the basis of West German regulations (*CW, Jan. 9, p. 87*), gave this progress report on the German law: Tolerance on diphenyl may be increased, he said, if German studies now under way show that an increase is needed. Currently the German regulation allows 70 ppm.; the U.S. tolerance is 110. However, Citrus Red No. 2 paraffin wax and mineral oil do not seem likely to get approval for use at any level.

Boyce feels that an increase in sulfur dioxide tolerance for dried fruit may be approved. He doesn't see much chance of getting changes in the near future in present regulations on labeling of citrus fruit. It's now necessary to label cartons, boxes, wrappings containing citrus fruits treated with diphenyl, sodium-*o*-phenylphenate and other products with the warning "peel not suitable for eating."

EXPANSION

Expansion by Sun: Sun Chemical Corp. (New York) has set up an ink manufacturing company jointly with Universal Printing Ink Co. Ltd. (Leeds, England) to serve the European Common Market. In the U.S., Sun has acquired Artistic Manufacturing Co. (Stamford, Conn.), which makes decorative packaging materials, and DynaFoam Corp. (Ellenville, N.Y.), producer of foam thermoplastic films.

●

Kohnstamm Abroad: H. Kohnstamm & Co., Inc. (New York), pro-

ducer of certified food colors and pigments, has entered into a joint agreement with British pigment maker, Horace Cory and Co., Ltd. (London). The agreement provides that Kohnstamm will have a major interest in Cory and that Kohnstamm products will be manufactured by Cory under Kohnstamm's label and supervision. The move entails construction of a new Cory plant near London, which will eventually replace that company's present facilities.

•

Midwest Tech Service: Alpha-Molykote Corp. (Stamford, Conn.) has set up a branch office and technical service center in Chicago. The company produces molybdenum disulfide specialty lubricants.

•

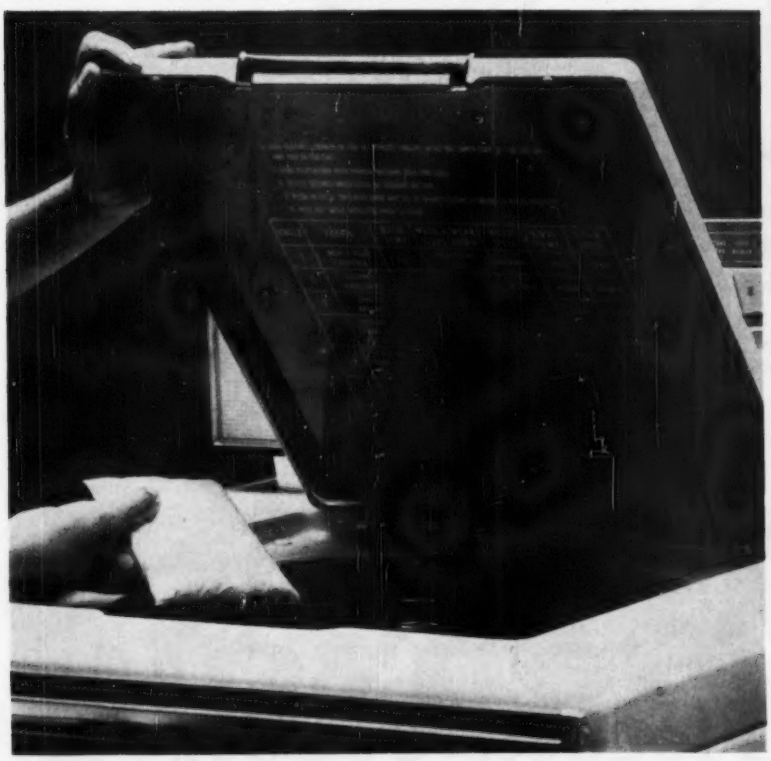
Joint Polymer Operation: The UBS Chemical Co. (Cambridge, Mass.) and The Permutit Co., Ltd. (London) will go into a joint venture for production and distribution of UBS's Ubatol polymer emulsions. The synthetic polymer products will be manufactured at Permutit's plant in Ponty Clun, Glamorgan, South Wales, for distribution to the floor polish industry in the United Kingdom and Europe.

•

Plant for New Starch: A. E. Staley Manufacturing Co. (Decatur, Ill.) is now constructing a 30,000-sq.ft. plant for manufacture of a new warp-sizing starch called Oxytrol.

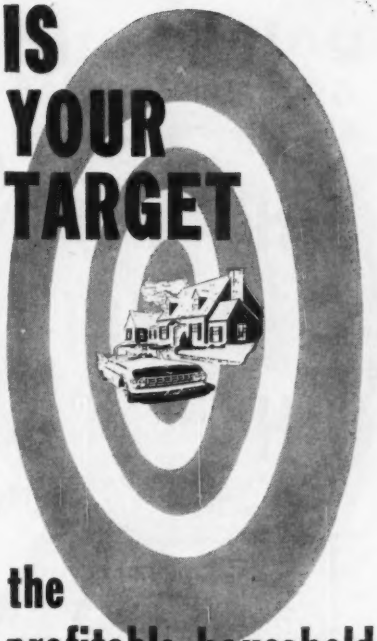
•

Exchange in Japan: Calink Chemicals (Japan) Ltd., a subsidiary of California Ink Co., Inc. (San Francisco), and Sakata Shokai, Ltd. (Osaka) have agreed to manufacture and distribute each other's products, as well as exchange technical knowledge. The com-



PVA Gets Tryout with Tide

The first national-brand laundry detergent to be packaged in water-soluble film is now being test marketed in Jacksonville, Fla. Procter & Gamble is trying out its Tide in polyvinyl alcohol film packaging, calls the product Redi-Pakds. The one-per-wash packets are boxed in two sizes: a "family" size (1 lb., 9½ oz.), which contains eight bags of detergent, and a "queen" size (3 lbs., 3¾ oz.), which contains 16 packets.



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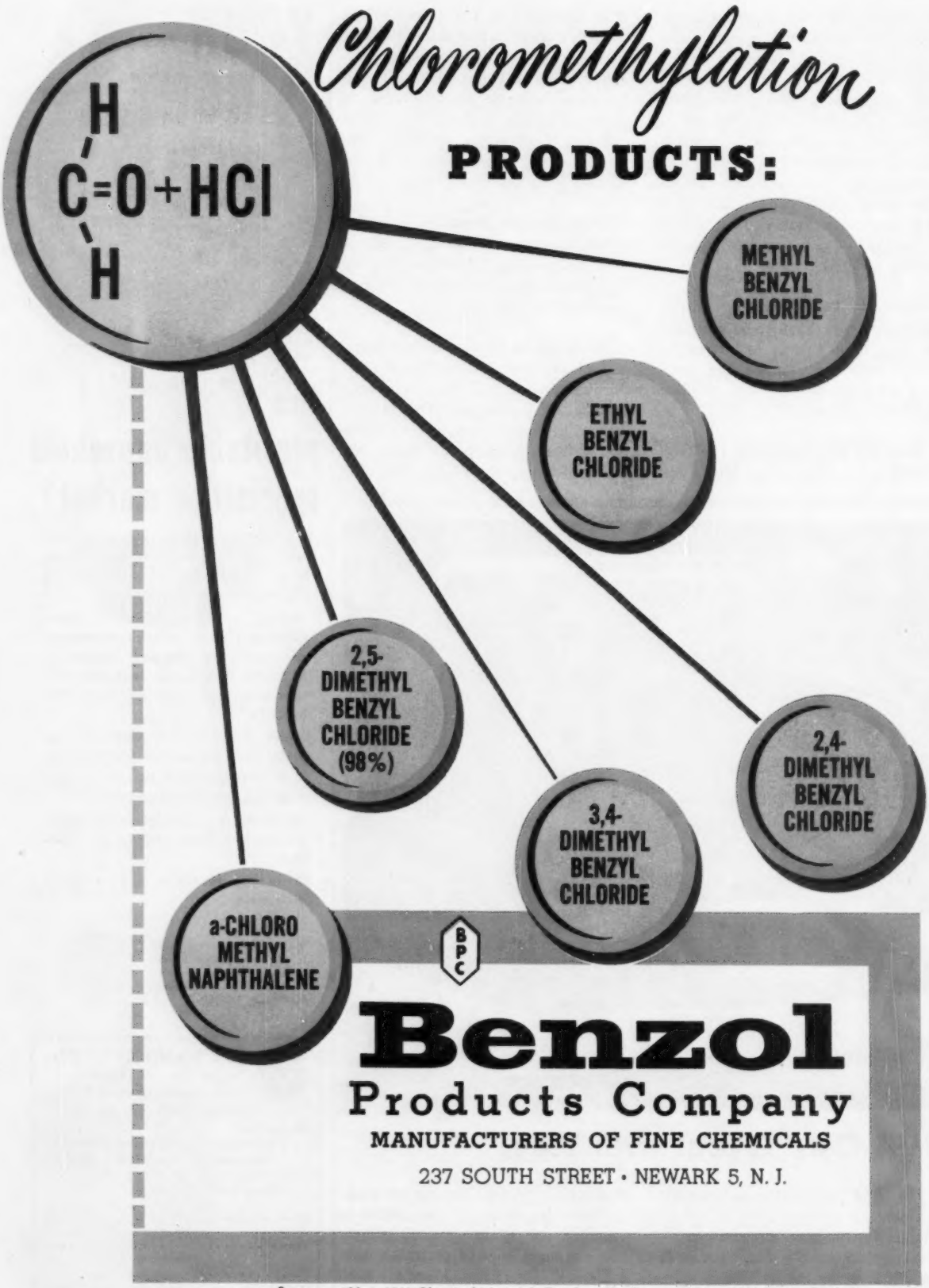


See page 130 — 1961 Chemical Materials Catalog —— See page 74 — 1961 Buyers Guide Issue

panies have parallel interests in coatings, packaging and graphic arts.

•

New Houston Firm: Armadillo Plastics, Inc. (Houston) has been organized to manufacture tanks, piping, plastic coatings, cements and adhesives for chemical and petrochemical plants and refineries. Full-scale production is due to start in September.

•

Color Buy: Interchemical Corp. (New York) has purchased Vansul Colors (Englewood, N.J.), producer of color bases for molded rubber products. Vansul, which had annual sales of more than $500,000, will operate from Englewood as a department of Interchemical's Color & Chemicals Division.

•

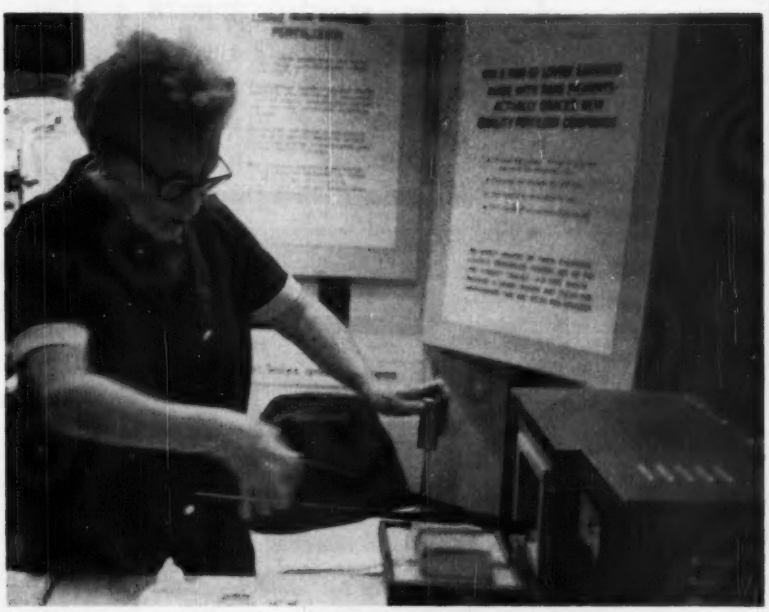
Specialties Expansion: Humphrey-Wilkinson, Inc. (New Haven, Conn.), maker of chemical intermediates and specialties, has increased its laboratory and production space by 15%.

PRODUCTS

P&G Tests Downy: Procter & Gamble Co. (Cincinnati) has introduced a new fabric softener called Downy. The blue liquid softener, packaged in a blue plastic bottle, is being tried out in Indianapolis, Ind., Portland, Me., and Lubbock-Amarillo, Tex. It is priced competitively with other fabric softeners, comes in two sizes.

•

Rubber Calk: Products Research Co. (2919 Empire Ave., Burbank, Calif.) has developed PRC Rubber Calk 100 formulated for quick and tack-free application. The product is designed for sealing joints in concrete of jet airport runways, taxi strips, and aprons. It is said to withstand fuel and oil, weather and jet engine blasts. No primer is required for application, and the calk dries tack-free in 10 minutes and cures completely within 24 hours.



Fertilizer Doubles as Pigment

W. R. Grace & Co. won't say what is in its soon-to-be introduced line of fertilizers, but it does say they make good pigments. At the recent chemical exposition in New York, the company demonstrated how the fertilizer compounds can be used as pigments for enamels, ceramics and metals. The colors are said to resemble those used on Chinese pottery. As for the fertilizer applications of the materials, about all Grace says now is that the compounds are nonburning, are premium-priced, are in semicommercial production, and are to be sold through another company.

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We can make your preliminary site-seeing easy. Just phone for basic facts about the locations best suited for chemical plants. There are certain spots that have special features worth giving more than a quick once-over.

For example . . .

SEE the chemical sites north of MEMPHIS

Let us send you a free map of our Woodstock development. We acquired this property for the benefit of substantial industries. Your neighbors will be folks like du Pont, Grace Chemical and Montana Ferroalloys. Abundant natural gas, low-cost power and fresh water.

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Where odor is a problem
use these SHELL SOLVENTS

SHELL SOL 71 AND 72

. . . have no odor, are ideal for interior finishes, polishes and cleaners. Shell Sol 71 offers slightly faster evaporation.

SHELL SOL 360

. . . much faster evaporation than mineral spirits, low odor, over 100° F. flash point.

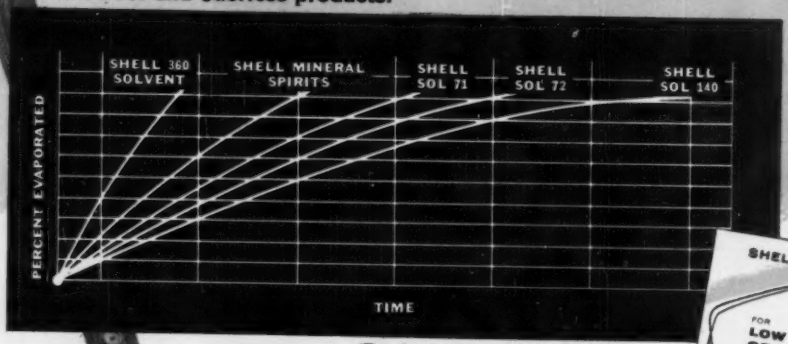
SHELL SOL 140

. . . a high-flash, slower drying solvent with unusually low odor.

SHELL MINERAL SPIRITS

. . . traditional distillation range, solvent power and drying. Mild odor.

These solvents are recommended for low odor and odorless products.



Typical properties of these Shell Solvents are contained in booklet shown. It will be mailed on request.

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK

100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

Technology
Newsletter

CHEMICAL WEEK
October 1, 1960

A method of making polyolefin fibers dyeable is described in Australian patent application 57,463/60 by Montecatini. Polyalkylimines are incorporated in the molten polyolefin, which is extruded, stretched, and subjected to finishing operations.

Industrial Rayon Corp. (Cleveland) tells CHEMICAL WEEK it is making progress on the polypropylene dyeing problem and can now dye piece goods in pastel colors "by at least two different methods." The firm won't tell more at this stage, except to say its work is on "modifications of conventional dyeing techniques."

•

Another entry into the polynosic (high modulus) fiber field was registered by Courtaulds Ltd. (Montreal, Can.). The firm claims that fabrics made from its new cellulose fiber, tradenamed Moynel, can be made crease resistant without loss of strength. Fabrics made from the fiber can be mercerized—given a silky luster—and they can be stabilized by compressive shrinking processes.

•

Improved fire detection by ultraviolet radiation sensing is the hope of McGraw-Edison Co.'s Thomas A. Edison Industries (West Orange, N. J.) for its new electronic tube now in pilot production. Although similar devices are now in use for detecting burner flame-outs (*CW, Sept. 17, p. 91*), the company expects to crack the ordinary fire-detection market because of the tube's great sensitivity, simplicity and low cost. It's sensitive only to wave lengths between 1,900 and 2,900 angstroms, picks up the one part per million of ultraviolet present in normal flames, but rejects direct sunlight, glass-enclosed illumination and cosmic and nuclear radiation.

The tube will cost about $10; and because it amplifies the ultraviolet pickup 600 billion times, only simple circuitry—i.e., a resistance at the tube, a transformer and relay (which might increase total tube cost to $20)—is required to hook in with alarm and fire-fighting systems.

•

Russian-English translating machine progress: A 600,000-word "dictionary," largest of its kind, for use in computerized translation of Russian technical literature, has been developed at the University of California (Berkeley). The mechanical dictionary, called Rusdic, is used in conjunction with an IBM 704 digital computer, which translates about 125 words/second. On the faster IBM 7090, it would translate about 500 words/second, at a fraction of the cost of translation by human beings. The University of California program will be expanded to include translation of Chinese technical literature.

A new Air Force Russian-English translating machine uses a glass disc, coated with high-resolution photographic emulsion at Eastman Kodak (Rochester), to store a 55,000-word vocabulary. The disc is scanned

electronically until the machine matches a Russian word—fed in with punched tape—to its English equivalent, which is printed automatically. Modifications of the machine, which now translates 40 words/minute, are expected to boost its speed to 2,400 words/minute.

•

Ultrapure water having an electrical resistance equivalent to that of theoretically pure water—24 million ohms/cubic centimeter at 64 F—is being produced by a process developed by Bogue Electric Manufacturing Co. (Paterson, N. J.) for an undisclosed semiconductor manufacturer. The water is used in all stages of production of pure silicon components (*CW, Jan. 16, p. 64*)—for rinsing pure silicon wafers, and washing crucibles, shipping containers, and manufacturing machinery.

In Bogue's process, source water is treated, filtered, evaporated, then passed through a cation exchanger, an anion exchanger and finally a mixed-bed ion exchanger. Investment costs for a 100-gal./minute unit are $40,000—about $400 for each gpm. of capacity and about twice that of units producing less pure water, for example, of 18-20-million-ohms resistance.

•

Reportedly the first closed-loop computer controlled plant outside the U.S. will be installed by Badish Anilin- & Soda-Fabrik AG, at its Ludwigshafen, Germany, plant. Although trade talk had earlier hinted at the event, it wasn't disclosed officially until this week. Control will be provided by a Thompson Ramo Wooldridge RW-300 computer; nature of the process hasn't been revealed.

•

Another computer development this week: a general-purpose digital computer can now be used for automatic process control instead of specially designed process control computers, according to Bendix Vice-President R. C. Fuller.

The Bendix Computer Division (Los Angeles) is using its G-15 general-purpose digital computer as the key unit in an automatic process-control system it is demonstrating at this week's Instrument-Automation Conference at New York's Coliseum. The system is designed for material-blending operations in refineries, petrochemical plants and food producing plants.

•

Commercial stearic acid has not been found to cause chick edema as reported in CHEMICAL WEEK (*CW, Sept. 24, p. 104*), although the Food & Drug Administration does require that it be free from this factor if the fatty acid is to be used in food emulsifiers. Reason: in a few instances oleic acid, which might be converted into stearic (although this is not a practical commercial procedure), displayed this form of toxicity. Oleic acid for food emulsifiers must also be free from chick edema factor, according to FDA regulations.

Coty

INCREASES SALES WITH AEROSOLS: By packaging L'Aimant fragrance in aerosol form, Coty created a new "spray-mist" product that is outselling the original bottled L'Aimant toilet water 2 to 1!

If your product can be brushed...sprayed...squeezed or poured—it may be more marketable as an aerosol

Does your product meet the requirements above? If it does, there is a good chance aerosol packaging can create the sales magic it has for Coty and many other personal- and home-product manufacturers.

Convenience is the secret behind the success of aerosols. It's the neatest, handiest, quickest way to apply a product—and the buying public is well aware of these advantages. In the cologne field alone, aerosols have 51% of the market and are increasing their share by 20% annually!

Get the complete story. It's easy to have your product tested by a custom filler—no need for your own loading line. Let Du Pont send you technical data and a list of aerosol loaders. It's a service offered without obligation by Du Pont, manufacturer of time-proved "Freon" propellents for aerosols.

Free booklet "Package for Profit" contains information on how you can enter this field without major capital investment...includes marketing and technical data. Write: E. I. du Pont de Nemours & Co. (Inc.), "Freon" Products Division, N-2420, Dept. 3310, Wilmington 98, Delaware.

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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

NEED A DETERGENT?...
WETTING AGENT?...
EMULSIFIER?

TRY SWIFT'S SOLAR 90

HIGHLY CONCENTRATED
ANIONIC ALKYL ARYL SULFONATE

When you need a high quality dry synthetic surfactant so highly concentrated that 0.05% to 0.10% will give effective wetting and dispersing action, Solar 90 may be the answer. It is 90% active dodecyl benzene sulfonate with low salt content. Available in flakes or granules, both forms are uniform and free flowing. As a result of Swift's unique method of manufacture, both forms are less hydroscopic than most materials of this type.

Drum dried Solar 90 Flakes and Granules are being used in the manufacture of textiles, paints, cement, agricultural chemicals, synthetic rubber and cleaning chemicals. Evaluate Solar 90 in your process or products. It is highly soluble, high foaming and easily rinsed. It is an excellent starting material for the manufacture of detergents, cleaners, bubble bath compounds, etc. Solar 90 may save you money and improve production. Place a trial order, today.

Solar 90's are part of the extensive line of synthetic surface active agents and detergents manufactured by Swift & Company. Additional information on Solar 90 and other Swift synthetics are presented in a 24-page bulletin. Write for your copy, today.

TYPICAL ANALYSIS SOLAR 90

	Flakes	Granules
Form	Flakes up to ⅛in. dia.	Fine granular flakes
Color	Creamy white	Creamy white
Odor	Very slight, pleasant	Very slight, pleasant
Active Ingredient, %	90, min.	90, min.
Density, gm/cm	0.44, average	0.77, average
pH, 1% Soln., 25°C.	9.0	9.0

Swift

105TH YEAR

SWIFT & COMPANY
SOAP DEPARTMENT
4115 Packers Ave., Chicago 9, Illinois

To Serve Your Industry Better **with a complete line of soaps, synthetic detergents and surface active agents, metallic stearates and related products.**

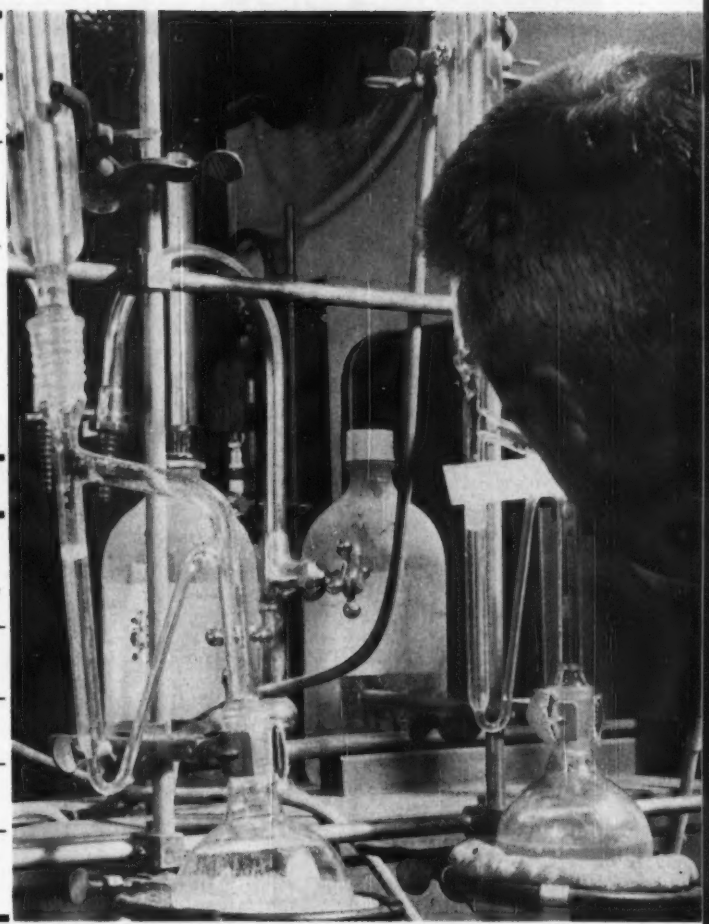
S-78

The "Average" Research Director	
Salary: $25-30,000	**Bonus: $2-4,000**
Number of technical employees: 100	
Annual budget: $2,000,000	
Age: 45-50	
Years in CPI: 20	
Years in research: 20	
Years with company: 15	
Years in present position: under 5	

Salary Trend Shows Big Shift Upward

Salary range	'55	'57	'60
	Percentage of research directors in each range each year*		
Under $15,000	**58.0**	**16.3**	**10.0**
$15-25,000	28.0	39.6	35.0
Over $25,000	**14.0**	**44.1**	**55.0**
	100.0	100.0	100.0

Source: CW surveys.



Increases in salaries and responsibilities mark research directors' growing role in the CPI.

Pegging Research Directors' Pay and Goals

The "average" research director is now earning close to $30,000/year in salary, plus several thousand dollars in bonuses (see top table above). This is the key result of Chemical Week's latest industry-wide salary survey. Compared with the findings of earlier salary surveys of research directors (CW, Nov. 2, '57, p. 30), the pay trend is still up.

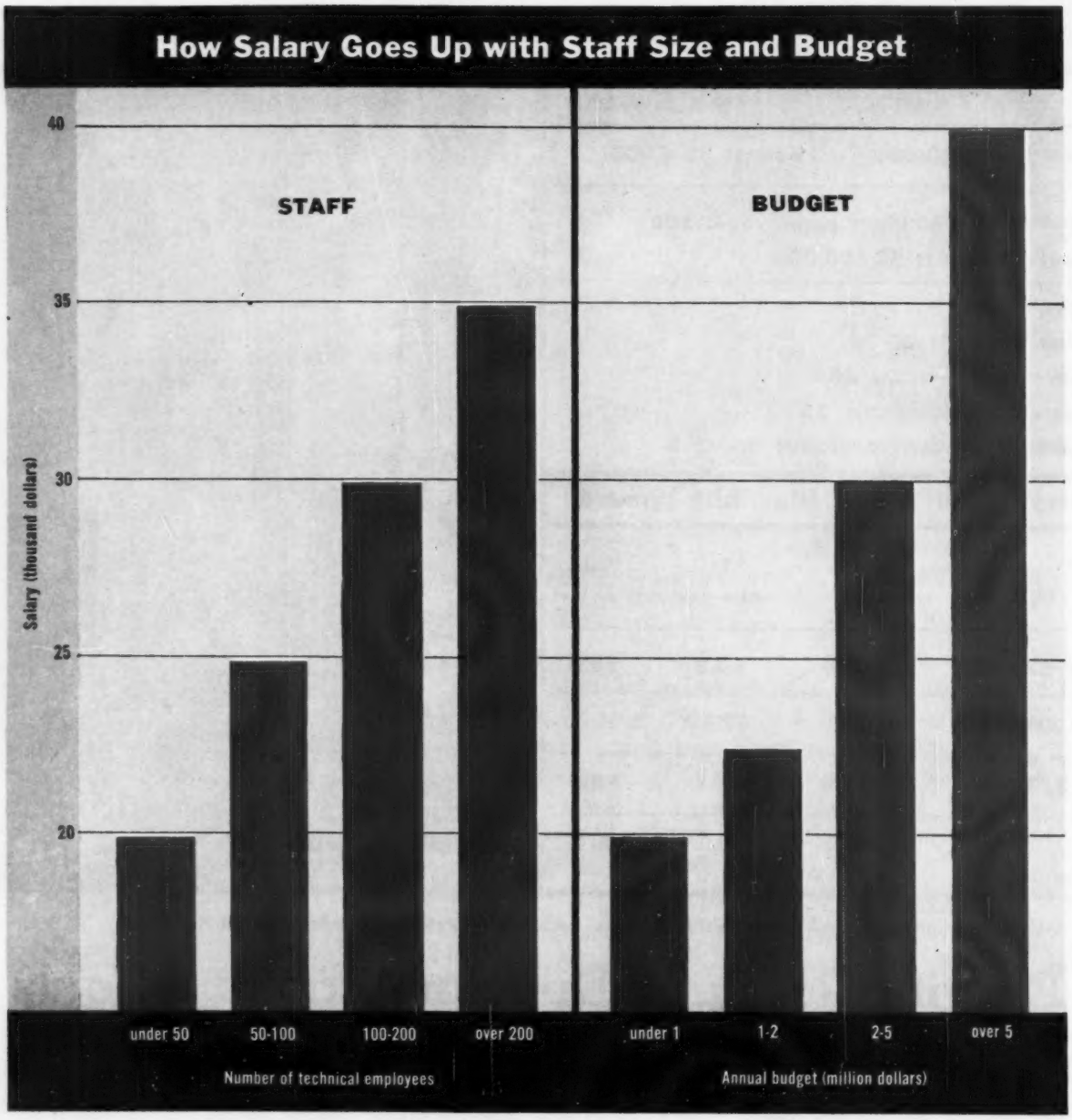
As could be expected, the size of a research director's salary rises with the size of his staff, but it appears to go up even faster with the size of the annual research budget for which he is responsible. Respondents to CHEMICAL WEEK's questionnaire indicate that their median annual research budget is about $2 million and that approximately 100 technically trained people are under their direction. (The questionnaire was sent to large, medium and small companies on a roughly equal numerical basis.)

Other attributes of the mythical "average" research director: he's a Ph.D.; is close to 50 years old; has roughly 20 years' experience in the CPI, but fewer than five years in his current job; has spent little or no time in any functions outside of research and is not interested in moving out, except for some vague ambitions toward general corporate management. He doesn't expect a transfer within five years and is uncertain about a promotion, but definitely expects a raise of at least $1,000 in that time, and most likely one of $5,000 or more.

Still Going Up: One of the main findings of the previous CHEMICAL WEEK research director salary survey in '57, was the sharp upswing in salaries since the survey in '55. Salaries are up again in '60, but not quite as sharply.

The percentages that fall into each of three salary ranges—under $15,000, $15-25,000, and over $25,000—tell the story. The lowest group accounted for 58% of the '55 respondents; this number dropped to 16.3% in '57, slid further to 10% this year.

The other end of the scale, those over $25,000, included only 14% of the respondents in '55, but rose to 44.1% in '57 and now stands at 55%. The middle group—$15-25,000—has



been relatively stable, with figures of 28%, 39.6% and 35%.

Responsibility Pays: Comparison of salaries with staff size (technical employees) and annual budget shows the expected result, that salary is closely related to both these measures of responsibility. Research directors with technical staffs of under 50, 50-100, 100-200 and over 200 have approximate median salaries of $20,000, $25,000, $30,000 and $35,000, respectively.

Of those directors heading over 100 technical employees, 81% earn over $25,000, while 74% of those with staffs under 100 make less than that amount. The division is just slightly sharper when based on budget: 85% of research directors handling budgets of over $2 million earn more than $25,000, while 75% of those with smaller budgets have salaries under $25,000.

Dividing budget sizes into four groups—under $1 million, $1-2 million, $2-5 million, and over $5 million—shows a salary relationship that picks up sharply after the $2-million mark. Respective salary medians for each of the four budget ranges are $20,000, $22,500, $30,000 and $40,000.

Big Bonuses: In addition to their regular salary most of the survey's respondents—about 70%—receive additional compensation, such as a bonus. On the basis of each 10 research directors surveyed, three (approximately) got no bonus in '59, three got up to $4,000, two got $4-10,000, one got $10-20,000, and one got over $20,000.

And high bonuses do not necessarily go with low base salaries. Many

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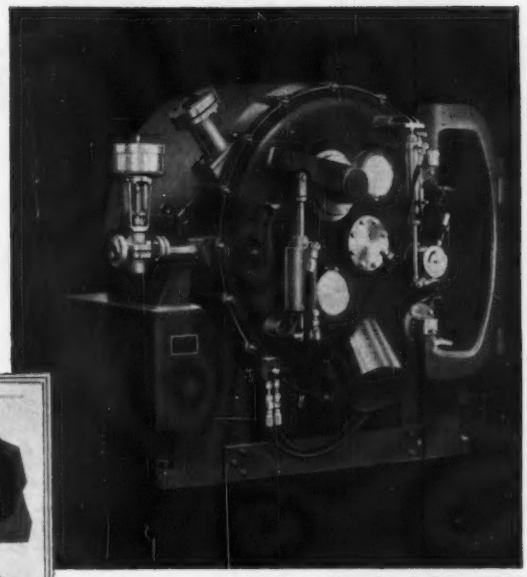

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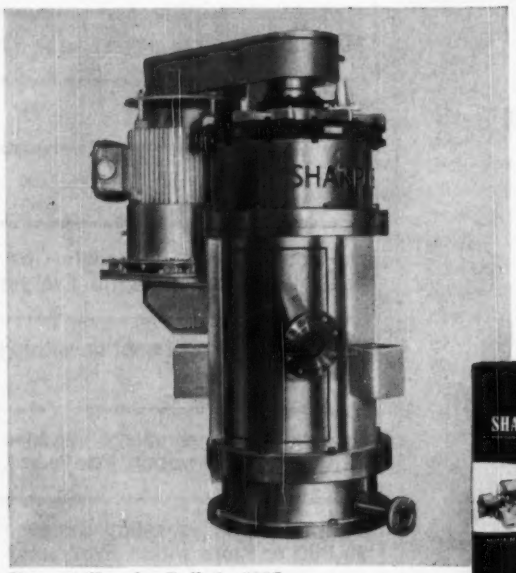

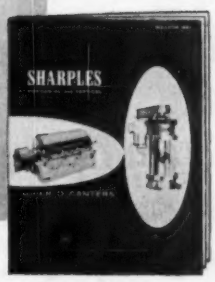

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Research Directors Tell of

Would you be **qualified** for a position of equivalent or greater responsibility **outside** the **research** function?

Would you be **happy** in a position of equivalent or greater responsibility **outside** the **research** function?

Are you happy in the position that you have now?

In what other functions . . .

MANAGEMENT

PRODUCTION

ENGINEERING

MARKETING

OTHER

Do you foresee a transfer to an equivalent position within five years?

Do you foresee a promotion within five years?

Do you expect a salary increase of $1,000 or more within five years?

Do you expect a salary increase of $5,000 or more within five years?

of the top bonuses went to men already well up on the salary scale.

Experience Index: In answer to separate questions on how long they had been in (1) the chemical process industries, (2) the research function, (3) their present company, and (4) their present position, the research directors reported a median experi-

Background, Interest, Hopes

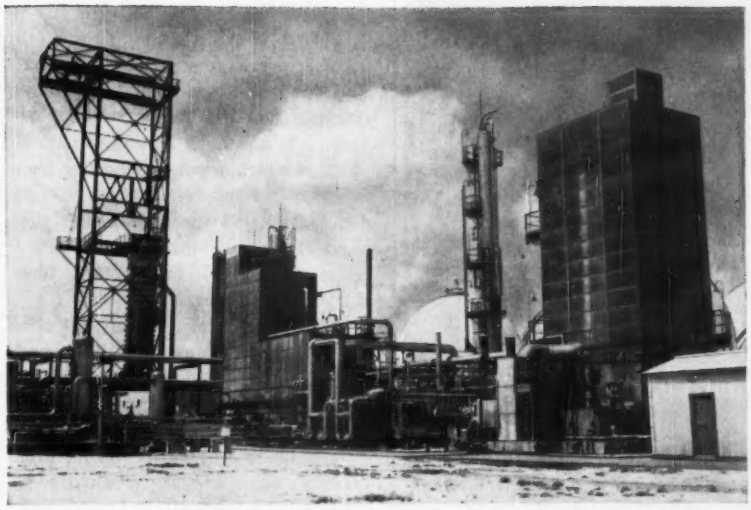
Yes	No	No Reply
65%	30%	5%
40%	45%	15%
92½%	5%	2½%

. . . have you had experience	would you be qualified	would you be happy
0%	30%	17½%
15%	25%	10%
15%	2½%	2½%
7½%	7½%	5%
5%	2½%	0%

Yes	No	No Reply
7½%	87½%	5%
42½%	47½%	10%
90%	7½%	2½%
70%	17½%	12½%

ence of roughly 20 years in each of the first two categories, just over 15 years with the company and under five years in their current job.

The similar figures for CPI experience and research indicate that any nonresearch jobs held were only of short duration. And research directors are not company-hoppers, as shown



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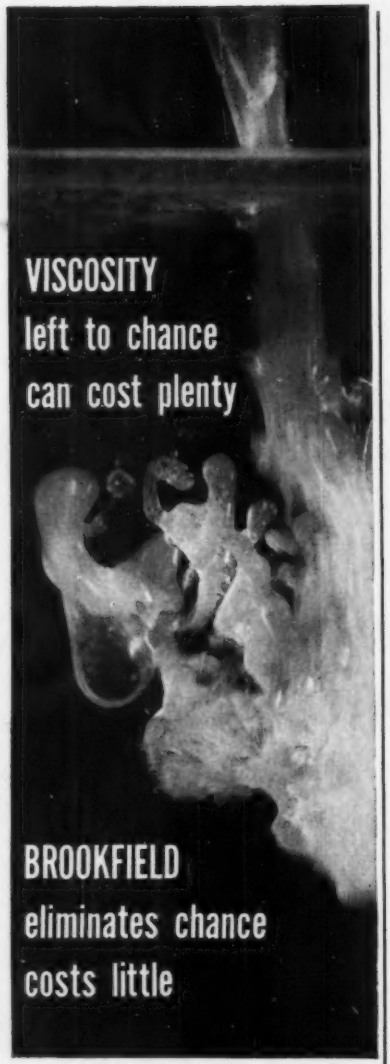

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by the high company service figure.

A look at educational background confirms that the trend to higher degress is continuing. This year 12½% of the research directors reporting have bachelor degrees only, compared with 18% in the '57 survey. On the other hand, 15% have master's, compared with 13% in '57, and 72½% have doctorates, compared with 69%.

As a group, the research directors are relatively young. Just over half —52½%—are between 45 and 55. However, 32½% are under 45, while just 15% are above 55.

Sticking to Research: The research directors were also asked about their experience, qualifications and interest in jobs outside the research function. Although 65% say they would be qualified for a nonresearch job of equivalent or greater responsibility, only 40% think they would be happy in such a position. A resounding 92½% reported that they were happy in their present position.

Less than half of the research directors have had experience outside research, with the most common areas of other experience being production and engineering—15% each. Another 7½% have had marketing experience. while 5% worked in other areas.

Those who feel qualified to assume high responsibilities in each of these areas show a different distribution: 25% in production, 7½% in marketing, only 2½% in engineering and 2½% in other fields. In addition, 30% stated that they are qualified to step into general management.

Only 17½%, however, express an interest in moving to general management, and even smaller numbers say they would be happy in other functions: 10% in production, 5% in marketing, and 2½% in engineering.

Looking Ahead: In line with their feelings about nonresearch work, only 7½% of the research directors said they expected a transfer to an equivalent position outside research within five years. Promotions, however, were foreseen by 42½% of the respondents. Raises are anticipated by almost all. At least $1,000 more within five years is expected by 90% of the research directors, while 70% look forward to raises of $5,000 or more in that time.

Judging from past salary trends, these expectations are likely to be well-founded.

Doubled Space Payload

Payload of U.S. space and orbital vehicles may be doubled as the result of recent tests on a liquid fluorine—liquid hydrogen propellant rocket engine. Bell Aerosystems Co. (Buffalo, N.Y.) has completed 600 static firings with the new, turbopump-fed engine for the National Aeronautics and Space Administration. Thrust levels as high as 35,000 lbs. have been achieved, according to William Gisel, president of the firm. The tests open the door to lighter, smaller engines that do not sacrifice the performance of conventional engines.

Three hundred of the firings were made using liquid hydrazine and hydrazine blends instead of liquid hydrogen as the fuel, Gisel said. Allied Chemical's General Chemical Division, which developed the method for shipping and handling liquid fluorine in tonnage quantities, supplied the more than 40 tons of liquid fluorine used in Bell's tests. Personnel used normal protective measures, scored a perfect safety record working with the chemical.

New Ore Binder

Calcium lignosulfonate appears promising as a binder for non-magnetic ores that are pelletized in updraft or down-draft processes. That's the upshot of research at The Cleveland-Cliffs Iron Co. (Cleveland) laboratories in Ishpeming, Mich. Cost of the binder is about 1.5¢/lb., "more or less competitive with bentonite" for this purpose, the firm tells CHEMICAL WEEK. But the pellet so produced is 10 times harder than one made with bentonite, and the sulfonate contributes "heat value" (lowering the heat requirements for hardening and frying the pellets), which bentonite lacks. The sulfonate may also be useful in binding ores that are not roasted prior to shipment to blast furnaces.

The sulfonate binding process isn't suitable for all ores, the firm says but the market would still be sizable for the binder. About 2% calcium lignosulfonate on the weight of the ore concentrate is used. This means that at Cleveland-Cliffs alone, more than 120,000 tons/year of compound would be required.

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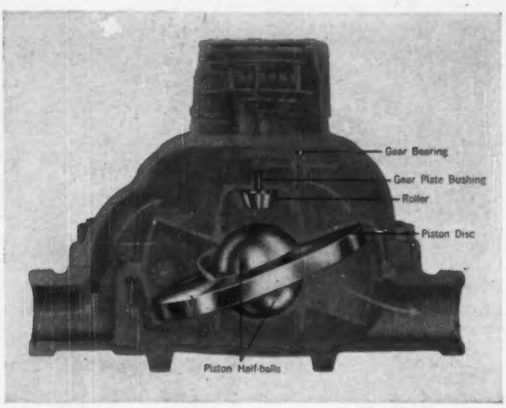

qualities. Five meter components, as indicated in the illustration, are made of KEL-F Plastic. They are molded for Buffalo Meter Company by Resistoflex Corp., Roseland, N. J., and the Garlock Packing Co., Palmyra, N. Y.

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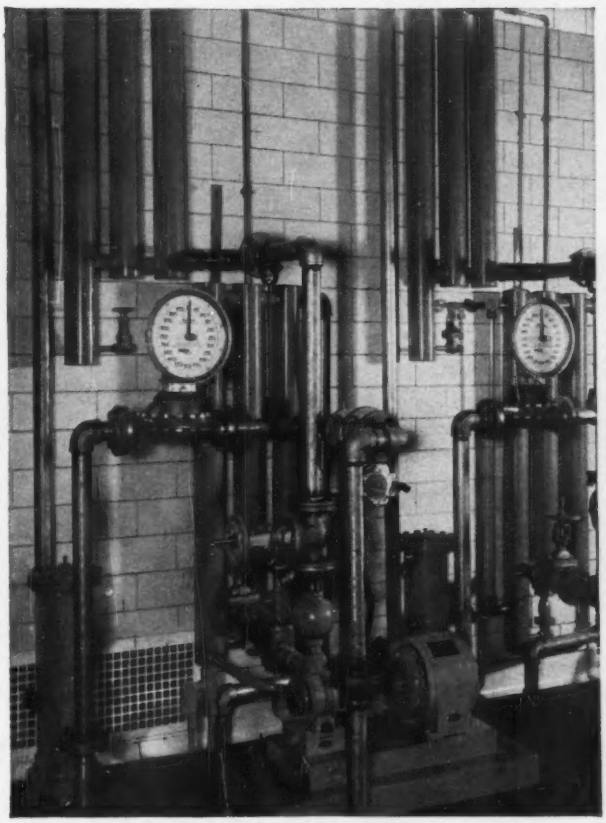

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Engineers rig spherical test chamber for explosion that will check effectiveness of protection system.

Checking Out Plan to Nip Blasts in the Bud

For the past four years engineers of Fenwal Incorporated (Ashland, Mass.) have traveled to a secluded test site near Framingham, Mass., to set off explosions inside spherical chambers like the one pictured above. Their objective: to prove the effectiveness of a British-developed system for detecting and suppressing explosions of a variety of materials used in industrial processing. Last week satisfied Fenwal unveiled the technique commercially in the U.S.

The system: ultrasensitive detection of pressure waves resulting from an ignition, then fast activation of devices that suppress or vent the explosion. The explosion area may be isolated with butterfly and flap valves, and explosion-suppressing materials are charged into other sections of the plant to prevent spread of the explosion.

Head Start: The company has a head start on industrial applications —eight systems are now on plant trial, six of them in chemical process industries plants. The technique passed its first test in action—a threatened explosion at Monsanto Chemical's Springfield, Mass., plant this spring.

Monsanto had installed the system in a plastics mill that had been rebuilt following an explosion late last fall. (The explosion, probably caused by tramp iron entering the high-speed mill along with the plastic, had damaged the equipment and blown out a wall used to isolate the area.) The first indication that the new protection system had snuffed out what might have developed into a similar explosion came when the system automatically halted operation of equipment.

Examination of the inside of the mill revealed traces of an explosion —e.g., charred product. But the equipment was not damaged and was quickly put back into operation.

Tailored to Order: Fenwal engineers point out that each system must be designed to fit the specific process equipment in which it's installed. The

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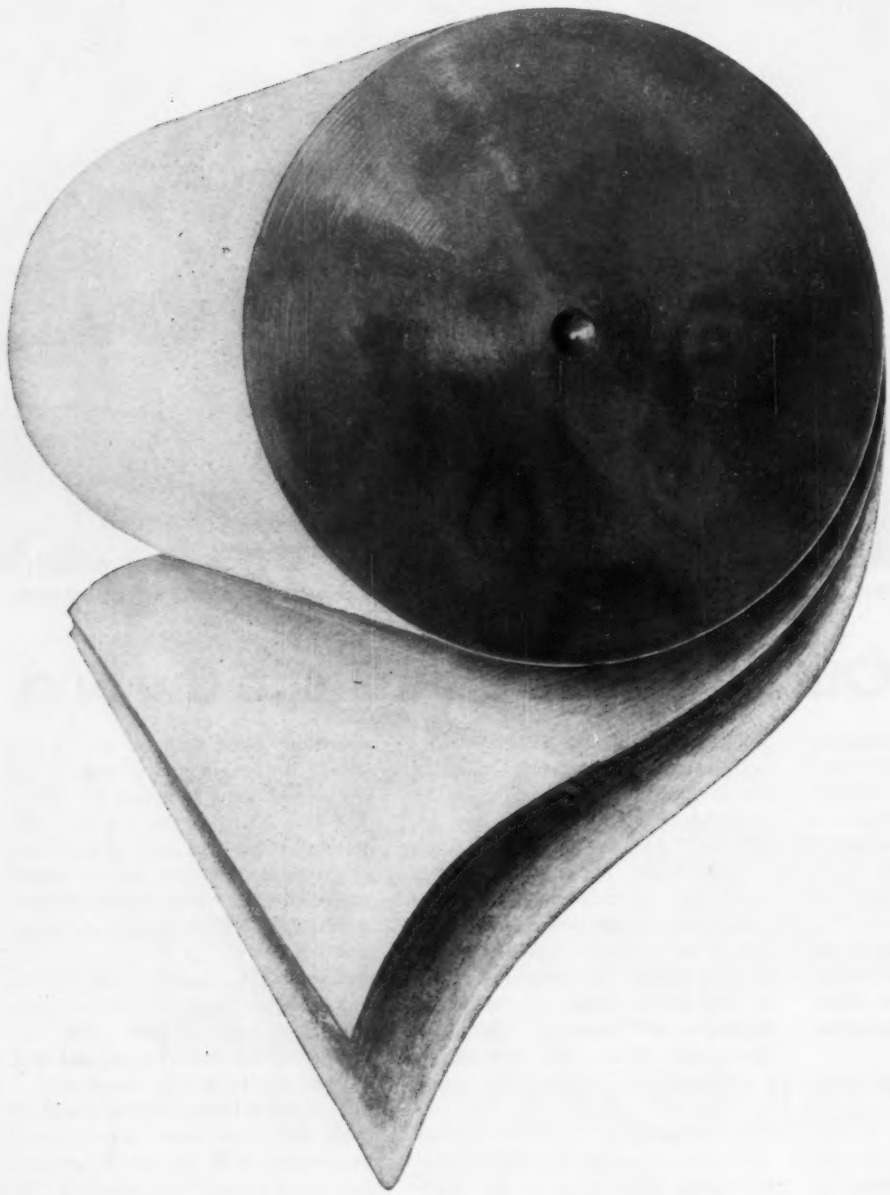

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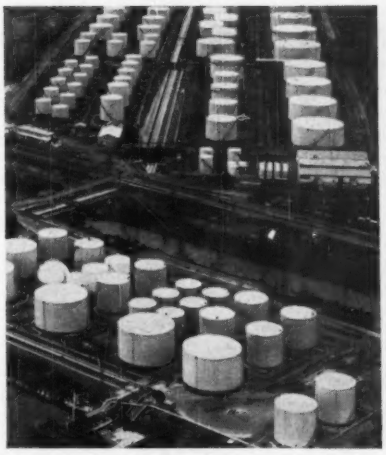

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basic principles, however, remain the same: An explosion is simply a fire that develops quickly. The time between ignition of a combustible mixture and the buildup of pressure to the point of destructive explosion may be only a few milliseconds. In many cases, however, that is sufficient time for an explosion to be prevented.

In the simplest system, a rubber diaphragm detector activated by the sudden pressure rise transmits an electrical impulse to a suppressor unit, where it triggers a detonator similar to a precision electric blasting cap used in seismic exploration. The suppressor unit—a metal hemisphere with creased surfaces that will burst in a predetermined, petal-like pattern—is ruptured by the explosive detonator, discharging as a fine mist the suppressant material it contains. The mist is evaporated by the heat in the explosion area, cooling the area to prevent further ignition.

The time between activation of the rubber diaphragm and discharge of suppressant: about 1 millisecond.

The most commonly used supressants are water and halogenated hydrocarbons (usually bromochloromethane). In aircraft engines, the fuel itself is a suppressant—in effect, it "floods" hazardous engines. Discharge rates range from about 200 to 600 ft./second. And, because of the speed of action, only small quantities (e.g., 5 cc. of water or 2 cc. of bromochloromethane for suppression in a 1 gal. volume) are needed.

Many Variations: In atmospheres where rubber diaphragms can't be used, Fenwal substitutes a metal diaphragm. However, the metal is less sensitive, is set for activation at a specific pressure rather than by rate of pressure rise. Also, the time from activation of a metal diaphragm to discharge of suppressant may be increased by a few milliseconds.

Radiation devices that detect the wave lengths of the spectrum existing in an explosive flame (but not those present in natural or artificial light) may be used in place of pressure-sensitive detectors.

Suppressor units of the rapid-discharge-bottle type may be located outside the process equipment, connected by a port that is opened by a detonator. Vents and isolation valves may be used in place of, or in combination with, suppressor units —often the protection becomes quite complex. Cost varies with the type and complexity of the system (e.g., in duct work, sensing elements are needed at intervals of about 20 ft.) but will probably average between $5,000 and $10,000.

Not for All: The system may be used for suppressing the explosion of many liquids, gases and dusts. But it is limited to oxidation-type explosions. Ethylene oxide is one of the materials Fenwal has researched, but its system has been unable to protect against explosions from it. Decomposition-type explosions can't be stopped because they travel too fast —detonation waves travel at speeds greater than 1,000 ft./second.

Raschig ring-packed towers are probably the best dampers for detonations, according to work done by Chemische Werke Huels (Germany) with acetylene (*CW, Sept. 14, '57, p. 82*). Huels' work did show, however, that quick-closing valves could be effective. They were ruled out as being too costly.

Battle of Britain: The British developed the system to protect aircraft fuel tanks hit by incendiary shells in World War II. Graviner Manufacturing Co. Ltd. adapted it for industrial use—since '54 no destructive explosions have occurred in equipment in the United Kingdom protected by the system.

Fenwal obtained exclusive manufacturing and sales rights for the system in the U.S. and Canada. Since '56 it has tested and modified the equipment to meet specific requirements in this country, adding some designs of its own. A licensing arrangement has been set up and Graviner and Fenwal will continue technical collaboration.

Continued research by Fenwal on faster suppression techniques may eventually lengthen the list of explosive materials the system can protect against. Other companies that are supplying fire-detection equipment also seem logical choices for conducting research, and some are now researching improved fire-detection techniques (*CW, Sept. 17, p. 91*). Whether they will get into the kindred, more specialized explosion protection field remains to be seen. Meanwhile, the Graviner-Fenwal system seems destined to help make chemical plants safer places to work.

Can't get enough rosin?

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Market Newsletter

CHEMICAL WEEK
October 1, 1960

There's worsening news for phthalate plasticizer buyers this week. Supplies of the esters, tight since the steel shutdown last fall, will become tighter, say producers. Reason: lagging U.S. steel output, which has cut the flow of naphthalene (and phthalic anhydride) to a trickle.

Some major users of dioctyl phthalate, diisooctyl phthalate and other esters are now on a 50% allocation basis and, according to trade observers, are considering a switch to tricresyl phosphate—despite the latter's higher price. (Current quotes, for example, show TCP at 32½¢/lb., vs. DOP at 26½¢.)

There was earlier optimism that steel production curves would rise this year, but now there's definite feeling in the industry that an improvement in steel output—and availability of coke-oven chemicals—will not show until sometime in early '61.

Although phthalate plasticizer prices were hiked at midyear (*CW Market Newsletter, June 18*), there is unmistakable concern among strapped customers that further increases are a distinct possibility should the critical shortages in naphthalene and phthalic continue through the next few months.

Reflecting the tight phthalate situation, tricresyl phosphates had a good year in '59 as the industry turned in a record performance of 31.4 million lbs. vs. the previous high of 29.9 million lbs. in '57. Sales also reached a new peak, totaling 30.8 million lbs.

•

Production of special solvents from petroleum has been started at British Petroleum's refinery in Kent, England. This is the company's first installation for these products in the U.K. Major use will be in the manufacture of paints and lacquers; other outlets will be in the essential oils, fatty oils and rubber industries. The plant, designed by BP, has a capacity of 30,000 tons/year.

•

Split prices in the anhydrous ammonia industry are still in effect, despite reports to the contrary published in trade papers earlier this week. Tabs throughout the East and Midwest are going up to $92/ton effective Oct. 1, but West Coast quotes remain repressed—about $26/ton lower than in other areas of the country (*CW Market Newsletter, Sept. 24*).

While some companies have attempted to hike the prices of anhydrous ammonia on the West Coast (*CW, Aug. 6, p. 58*), most producers have held at the $66/ton level. Those producers who have posted higher price schedules are equalizing their prices against the lower tabs.

•

Where will Monsanto locate its new phenol operation? This is the big question among marketing men this week. So far the company has

not specified the exact location, has indicated only that the plant will go up in the Texas City, Tex., area (*see p. 77*).

Current speculation, however, is that the new unit will likely be built on a 3,000-acre tract on Chocolate Bayou in Brazoria County, about 25 miles from Texas City. If Monsanto had in mind building next to its Texas City plant, it presumably would have specified the city rather than the area. But the company has just renewed its option on the 3,000-acre tract for another 90 days and a phenol plant could logically fit into the giant petrochemical complex that Monsanto plans for the Chocolate Bayou area.

•

Startup of acrylonitrile operations is due within the next month at Du Pont's Memphis, Tenn., plant. The multimillion-dollar unit has a capacity of about 50 million lbs./year. Meanwhile, the company has recently started construction on its Beaumont, Tex., acrylonitrile operation, expects to be onstream near the end of next year or beginning of '62. Capacity will be about the same as that of the Memphis plant.

•

A new sulfur recovery unit with a capacity of 15 tons/day of elemental sulfur is now onstream at Lion Oil Co.'s (division of Monsanto) refinery at El Dorado, Ark. Molten sulfur will be shipped to Monsanto's El Dorado chemical plant for use in making sulfuric acid. The acid will then be used in the manufacture of fertilizers, explosives and other organic and inorganic chemicals.

•

Another container for handling flammable liquids will soon be available to chemical shippers. Aluminum Tote-tanks, companions to Tote-bin dry-material containers, have just received Interstate Commerce Commission approval for the handling of materials having flash points above 20 F and all viscous materials. They're made by Tote System Inc. (Beatrice, Neb.). Up to now, these containers have found applications in the bulk shipping of liquid adhesives, resins and various food materials.

•

Union Tank Car Co. last week disclosed a substantial expansion of its overseas activities handled by Union Overseas Co. Union will soon complete the acquisition of Getz Bros. & Co. (San Francisco), thereby adding 30 offices around the world that offer marketing and transportation services.

SELECTED PRICE CHANGES—WEEK ENDING SEPTEMBER 26, 1960

	Change	New Price
UP		
Cocoa butter, bgs.	$0.01	$0.59
Coconut oil, crude, tanks, Pac Coast	0.00125	0.1225
DOWN		
Corn oil, crude, tanks, works	$0.00125	$0.12125
Linseed meal 34% bulk, ton	0.50	50.00
Peanut oil, crude, tanks, works	0.0025	0.155

All prices per pound unless quantity is quoted.

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VALVES

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Fig. 2474BSW—Bell-o-Seal (Packless) O.S.& Y. Globe Valve for 150 pounds W.P. Available in various corrosion-resisting metals and alloys. Can be furnished with screwed, flanged, socket welding or butt welding ends.

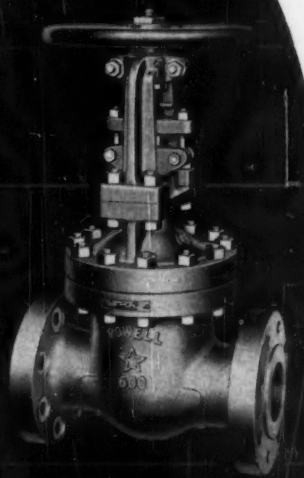
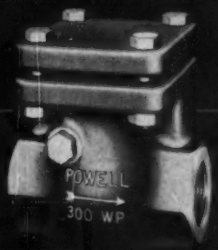


Fig. 6003SS—Large Stainless Steel Gate Valve for 600 pounds W.P. Face to face and end flange dimensions conform to latest standards. Sizes ½" to 24", inclusive.

Fig. 2345—Stainless Steel, screwed end Swing Check Valve for 300 pounds W.P. Available also with flanged or socket welding ends. Face to face and end flange dimensions of flanged end valves conform to latest standards.



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Right now, the PLURACOL* polyglycols are improving products, smoothing processes in many of the nation's major industries . . . and their potential is just beginning to be realized. For, the PLURACOLS come in a broad range of physical forms and molecular weights to meet the most specific requirements.

There are four liquid, and six solid grades in the PLURACOL E series of poly*ethylene* glycols — four liquid grades in the PLURACOL P series of poly*propylene* glycols. PLURACOL E's are available with molecular weights from 200 to 6000, PLURACOL P's from 400 to 2000. The following applications may suggest how they can work for you:

TEXTILES — Softeners, lubricants, dispersants, and emulsifiers are all prepared from members of the PLURACOL E series. Because of their wax-like nature, the solid grades function as knitting sizes for many types of yarns.

RUBBER — PLURACOL E's offer a particularly suitable combination of properties for use as mold-release agents. Completely water soluble, they are easy to apply and remove. Their low volatility holds losses to a minimum. And because they are wholly organic, they leave no unburned residue in molds, and have no harmful effects on rubber.

PHARMACEUTICALS — PLURACOL E's have found an important use in this industry as anhydrous, stable, bland bases for external preparations. They contribute a mild humectant action to lotions, and are useful as binders and anti-dusting agents in various cosmetic preparations. Higher-molecular-weight grades have been used as lubricants, coatings, and binders for pharmaceutical tablets.

PAPER — Liquid grades of the PLURACOL E series are used to advantage as paper softeners because of their extremely low volatility. They are plasticizers and humectants. Their properties also suggest application as antisticking agents in high-gloss mineral-coated papers, and as intermediates in the preparation of long-chain fatty esters used for defoaming paper.

PETROLEUM — PLURACOL E derivatives are used as demulsifiers for breaking crude-oil emulsions. PLURACOL E's also serve as selective solvents in the refining process. In hydraulic brake fluids and other functional fluids, PLURACOL P polypropylene glycols impart excellent viscosity-temperature characteristics; are noncorrosive to metals, easily inhibited to prevent oxidation in formulations, and do not adversely affect rubber.

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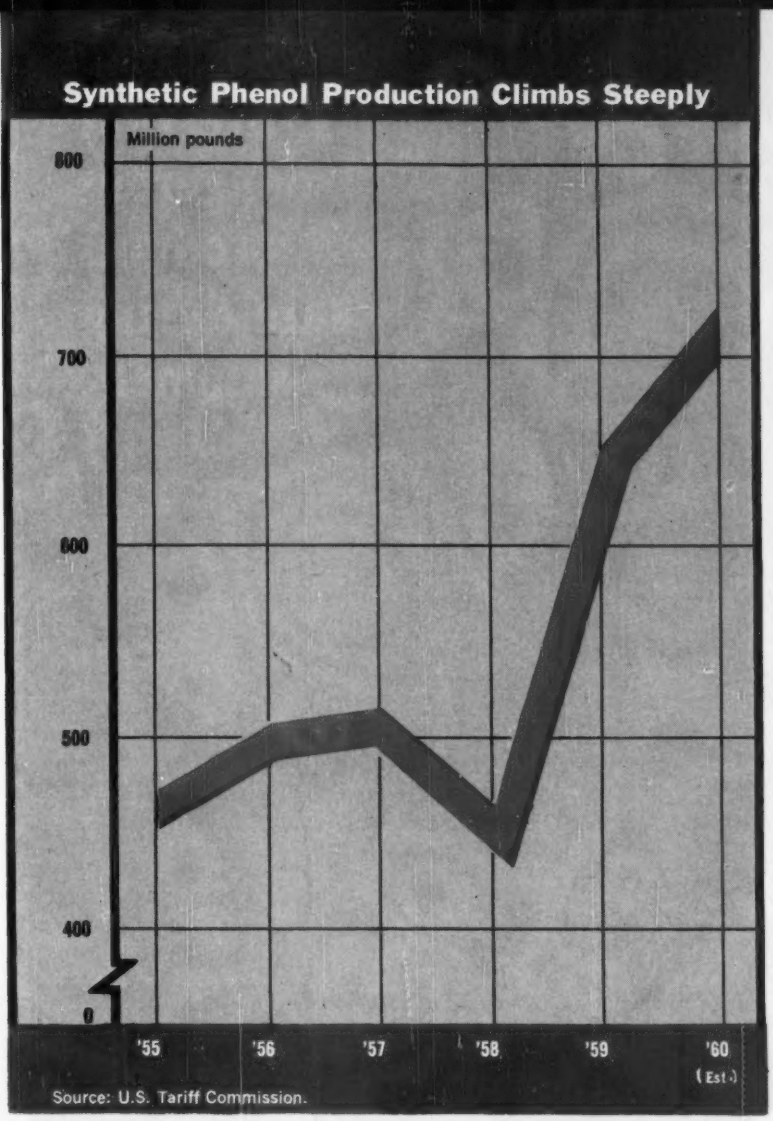
Feast Year for Phenol Producers



For the U.S. synthetic phenol industry, '60 has already shaped up as another big year. It will top last year's record output by 10-11%. And with prospects for continued growth in phenol consumption over the next few years, producers are already thinking about adding new capacity. Last week, for example, Monsanto unveiled plans for one such new unit, and meanwhile several expansions slated late last year are now going onstream.

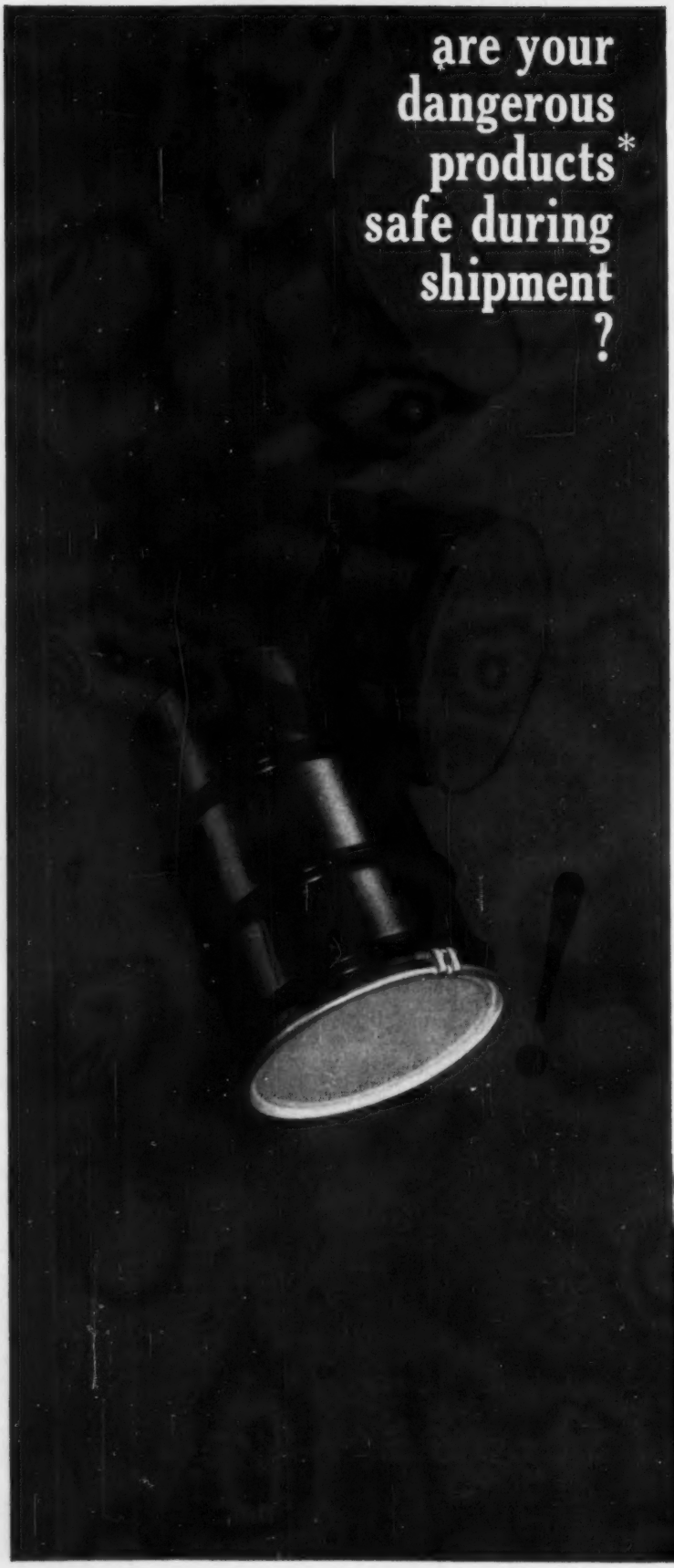
Monsanto, now the second-largest producer in the country, as well as a major phenol consumer, will strengthen its producer position by adding a 50-75-million lbs./year unit (its third). This will give the company a capacity of over 200 million lbs./-year. Although no specific site has been named for the new unit, it will likely go up in the Texas City, Tex., area. The plant, due for completion in mid-'62, will cost an estimated $6-8 million. In it, Monsanto will depart from the sulfonation process now being employed at its two other phenol facilities (Monsanto, Ill., and Avon, Calif.), will go instead to the cumene process. By reacting benzene (which is readily available in the area) with captively produced propylene, Monsanto will manufacture its own cumene.

Other Phenol Additions: These are the plants whose construction was begun last year and which are now going onstream:

- Allied has started to produce phenol at its new unit at Frankford, Pa. The additional 50-million-lbs./-year output potential doubles the company's capacity. As with the most other producers, a large share of the phenol is used captively, in this case mostly for caprolactam production.
- A multimillion-dollar expansion at Union Carbide's Marietta, O., plant was recently started up. This boosts UC's output potential from 85 million lbs./year to slightly more than 100 million lbs.
- Reichhold Chemicals' phenol expansion at Tuscaloosa, Ala., will be onstream shortly. This will raise the plant's output potential by 30 million lbs./year, to 90 million lbs./years.

RCI will not comment on reports that it will drop plans to build a 30-60-million-lbs./year phenol unit at Tacoma, Wash. Cancellation could be prompted by the recent softness in the plywood prices (a major outlet for phenol), plus Dow's plans, revealed earlier this year, to build a 36-million-lbs./year unit at Kalama, Wash.

Demand Pushes Capacity: Output of synthetic phenol jumped to a record 652 million lbs. in '59, an increase of 188 million lbs. over recession-ridden '58. This was also 137



They are if they're shipped in Inland steel drums. Designed for shipper assurance of compliance and safety, Inland open head ICC 17C and 17H drums are manufactured to withstand the punishing drop test with no leakage. Dangerous products can be packaged with more assurance that they will arrive "as shipped" at your customer's plant in this safe, secure drum. ■ Test and compare, as Inland's engineers have . . . prove for yourself that Inland constantly strives for only the best in steel container construction, interior linings, decorating and all other services that mean extra value to shippers.

* To be in compliance with Interstate Commerce Commission regulations, certain products classified as "dangerous" must be carried in steel drums that, when filled with water, can be dropped 4 feet onto solid concrete, striking diagonally on locking ring, with no leakage. Hydrostatic pressure tests of 15 psi and 30 psi for open head drums ICC 17H and 17C must also be successfully passed.

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**Patent Applied For

million lbs. higher than the previous record 515 million lbs., set in '57.

So far in '60, demand is continuing strong. Output during the first seven months of the year totaled 377 million lbs., an increase of 20% over the 313 million lbs. turned out in the same period of '59. At this rate, production of synthetic phenol will be between 725-750 million lbs. during the full year. Adding another 40-42 million lbs. of output from natural sources would boost total production to 765-790 million lbs.

There is little doubt that this high rate of production is straining some facilities and is stimulating the thoughts of increases. Adding up current capacity—including reported expansions by Monsanto, Carbide, RCI (excluding the Tacoma, Wash., plant), Dow and Allied—the industry is now operating at about 83% of capacity. And that is, theoretically, about the time producers consider further additions.

Rampant Growth: Since phenol finds its way into many end-uses, it's difficult to pinpoint where every pound goes. Some major growth areas are apparent, however, such as chemicals and fibers. And phenolic molding resins are still growing in use.

In fact, phenolic resins are still the largest outlet for phenol, although this share of the market has been slimming during the past few years. In '50, about 63% of the phenol consumed went into resin manufacture. This year, this outlet will consume only about half of the total phenol used by industry.

Some growth in this end-use is predicted during '60, will probably take an additional 10 million lbs. of phenol.

Chemical Going Up: Phenol-derived chemicals are a big factor in keeping phenol demand moving up. Alkyl phenols, bisphenol A (for epoxy resins), phenol phosphates, and polycarbonates are all important growth areas.

Alkyl phenols have become big consumers of phenol during the last few years. Biggest outlet for these products is in the rapidly growing markets for light- and heavy-duty surfactant formulations. Reports are that this market is very strong again this year. Other important alkyl phenol outlets include lube oil additives, rubber and butyl phenols. Overall outlook for this market in '60 is good—it may well consume 70 millions lbs. of phenol, 10 million lbs. more than in '59.

Bisphenol A, a major component of epoxy resins, continues in good demand this year, even though epoxy resins have not become volume chemicals as predicted. Last year epoxy output was 45 million lbs., and some 28-31 million lbs. of phenol were consumed. Since first-half '60 resin production was 32.8 million lbs., outlook is that it will top 60 million lbs. by year's end. This will mean demand for about 42-45 million lbs. of phenol.

Phenyl phosphates, used mainly as plasticizers, are another growing outlet for phenol. Manufacture of these compounds will require about 17 million lbs. of phenol this year, about 4 million lbs. more than in '59.

Chlorinated phenols output is higher this year; their requirements for phenol will go up 3-5 million lbs. to a total of around 45-47 million lbs.

Polycarbonates are just getting off the ground commercially this year. Mobay has started its facilities at New Martinsville, W. Va., and General Electric recently began production at Mt. Vernon, Ind. Polycarbonates will help to increase demand for phenol during the next few months, but just how much is questionable.

Fibers Factor: Production of caprolactam has played a big part in boosting phenol requirements. Last year, when Allied was pushing its caprolactam facilities to the limit, it had to buy phenol from outside sources. And demand is continuing strong in '60, will boost caprolactam's phenol consumption by 15-20 million lbs., to 85-90 million lbs., making this material the second-largest single outlet for phenol.

Moreover, Allied still has faith in the long-range outlook for its product. Recently the company's caprolactam producing facilities at Hopewell, Va., were expanded to 80-90 million lbs./year, and further expansion to raise the total to 140 million lbs./year is now in the works.

Growing Captive Outlets: Monsanto's recent expansions clearly reflect the growing captive outlets that take 75-80% of that company's phenol (and it is the U.S.'s second-largest producer). Examples:

- The company began construction of an alkyl phenol unit at Kearny,

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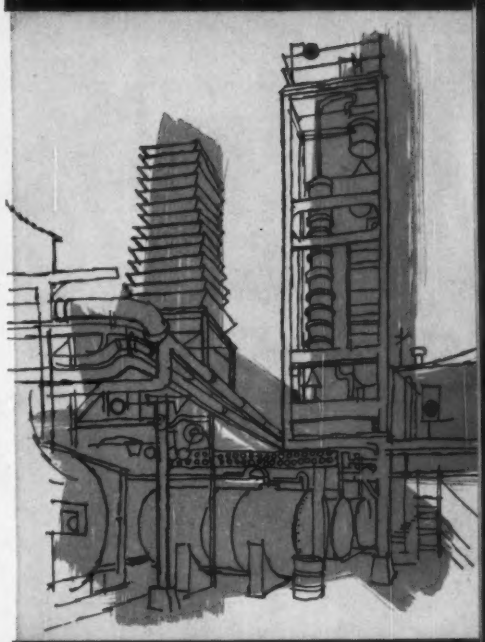

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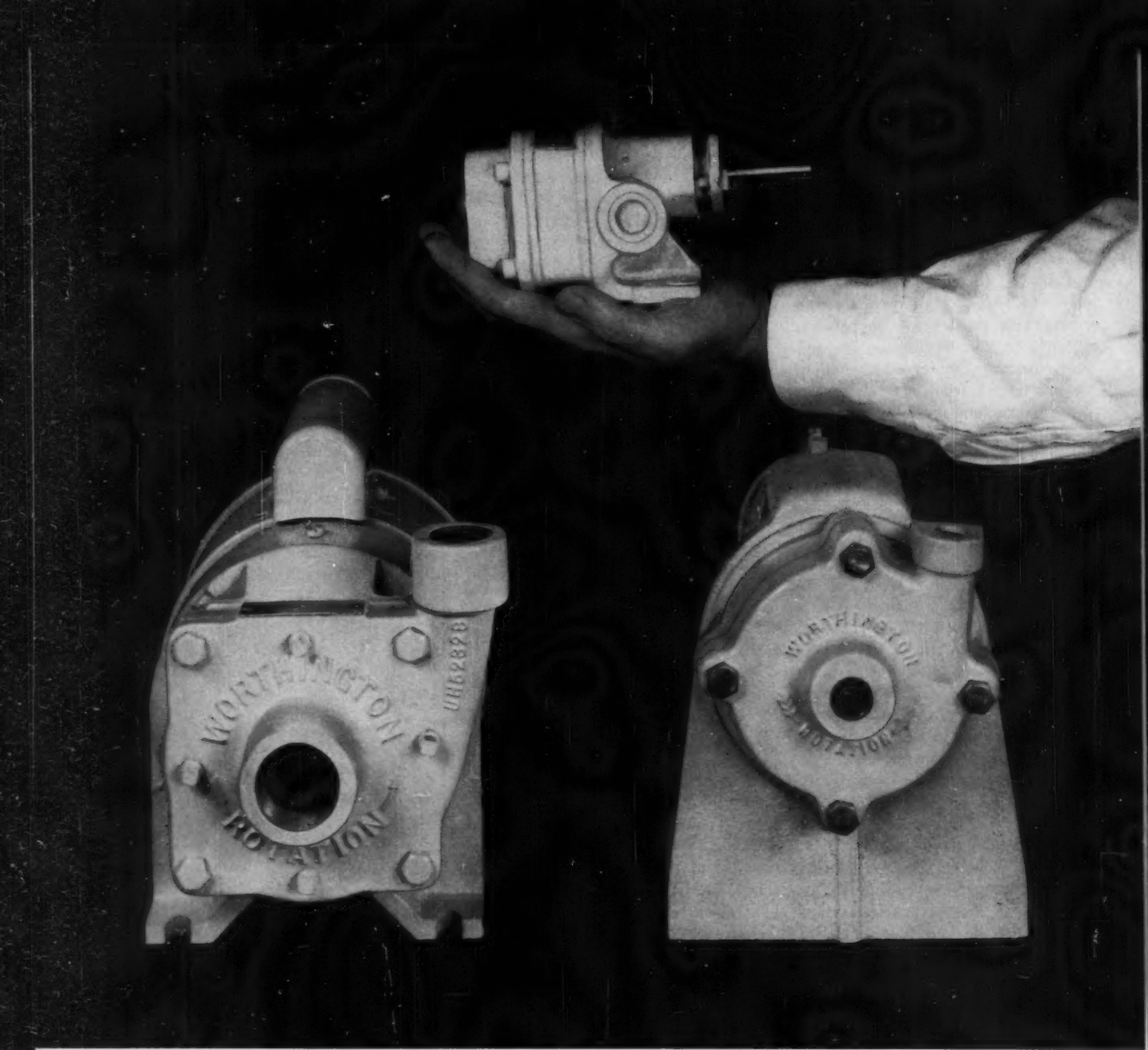

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Or look at the rotary which performs down to 4 gpm (150 psi) at 1750 rpm. It has one stuffing box to minimize leakage, few moving parts to cut maintenance, excellent suction lift, four-bearing construction, and the herringbone gears that are quieter and more efficient than spur gears.

For chemical and related industries, there is the new ⅜" Worthite pump with capacities to 18 gpm and heads to 55 feet. It has all the corrosion-resistant advantages of larger Worthite standard centrifugal pumps.

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*Located in East Orange, N. J. Our main large-pump plant is in Harrison, N. J.

WORTHINGTON

N.J., early in '60, with output slated for the production of the alkyl phenol-based ethylene oxide condensates for synthetic detergents (*CW, Feb. 13, p. 92*). This new plant is nearing completion, is due to start producing within the next month.

• Its acetylsalicylic acid capacity is being upped 25% at the company's St. Louis, Mo., plant. The new addition is also being cranked up, should be running later this month.

• Capacity of its Santophen-1, a phenolic germicide, is being doubled, and this expansion should be completed around March '61.

• For the third year in a row its bisphenol A capacity has been increased; output potential is now 15 million lbs./year.

With these new expansions coming in and the company already working its existing phenol facilities at a high rate, the previously mentioned expansion plans for phenol are easy to understand. The company is also modernizing its facilities at Monsanto, Ill. But these changes are largely to incorporate the latest process innovations and improve production economies, and they will not add much to capacity.

Way with Acetone: Choice of the cumene as starter for the new plant touches on another raw-material matter. About 0.6 of a pound of acetone is produced along with each pound of phenol. Monsanto can use some of this for bisphenol A and solvent uses. But this won't use all of the potential output of 30-45 million lbs./year of acetone. Some of this seems bound to hit the open market—but there is trade speculation that it may be upgraded into other materials. One strong possibility: methacrylates.

Monsanto now has a 100-million-lbs./year acrylonitrile operation at Texas City, but has no captive outlet for the nitrile—acrylic fibers are the largest market for this chemical. And Du Pont is the largest acrylonitrile consumer, using it for acrylic fiber manufacture. But Du Pont is planning to make its own acrylo (*CW, June 11, p. 74*). It's Memphis, Tenn., acrylonitrile unit is just about on-stream, and another operation is going up at Beaumont, Tex.

Already there are more than sufficient facilities for making acrylonitrile, and Du Pont's new plants will mean a glut on the market. Since acrylonitrile is made from acetylene and hydrogen cyanide at Texas City, it is a good possibility that Monsanto will react some of its unused HCN production with acetone, and get into the methacrylate field.

But unlike the outlook for acrylonitrile, phenol's immediate future is bright—for continued growth. A large share of output now going into chemical and fiber manufacture—and both these areas will continue to move ahead during the next few years—phenol producers will no doubt start unveiling still more expansions during the next few months.

MARKETPLACE

Silicon Capacity Increase: The first silicon metal to be produced by Reynolds Metals Co. was turned out by the company's Sheffield, Ala., reduction plant recently. Output came from a new furnace, which has a rated annual production of 5,000 tons/year of the metal.

Initial output will be used captively at the aluminum plant in Sheffield, largest of all Reynolds reduction plants. Some metal will be shipped to the other plants.

•

Polynosic Fiber Production: Production of Zantrel polynosic fibers is under way at Hartford Fibres Co.'s Rocky Hill, Conn., plant. This is the first time, according to C. Chester Bassett, Jr., vice-president of Bigelow-Sanford, Inc., that this cellulosic fiber, has been produced in the U.S. It was formerly imported from Europe.

•

Emulsion Output: Production of acrylic-based polymer emulsions is under way at the Langley, S. C., plant of Valchem (subsidiary of United Merchants & Manufacturers, Inc.). The plant's initial output will be of Acrival A-37, first in a series of acrylic emulsions for the paper and paperboard industries. Other outlets will be in the textile and nonwoven fabrics fields.

•

More Maleic: Steelwork for Heyden Newport's 24-million-lbs./year maleic anhydride unit at Fords, N. J., is in place. Startup date: early '62. A 250,-000-gal. benzene storage tank on the 290-acre site will supply plant consumption of 12,000 gal./day.

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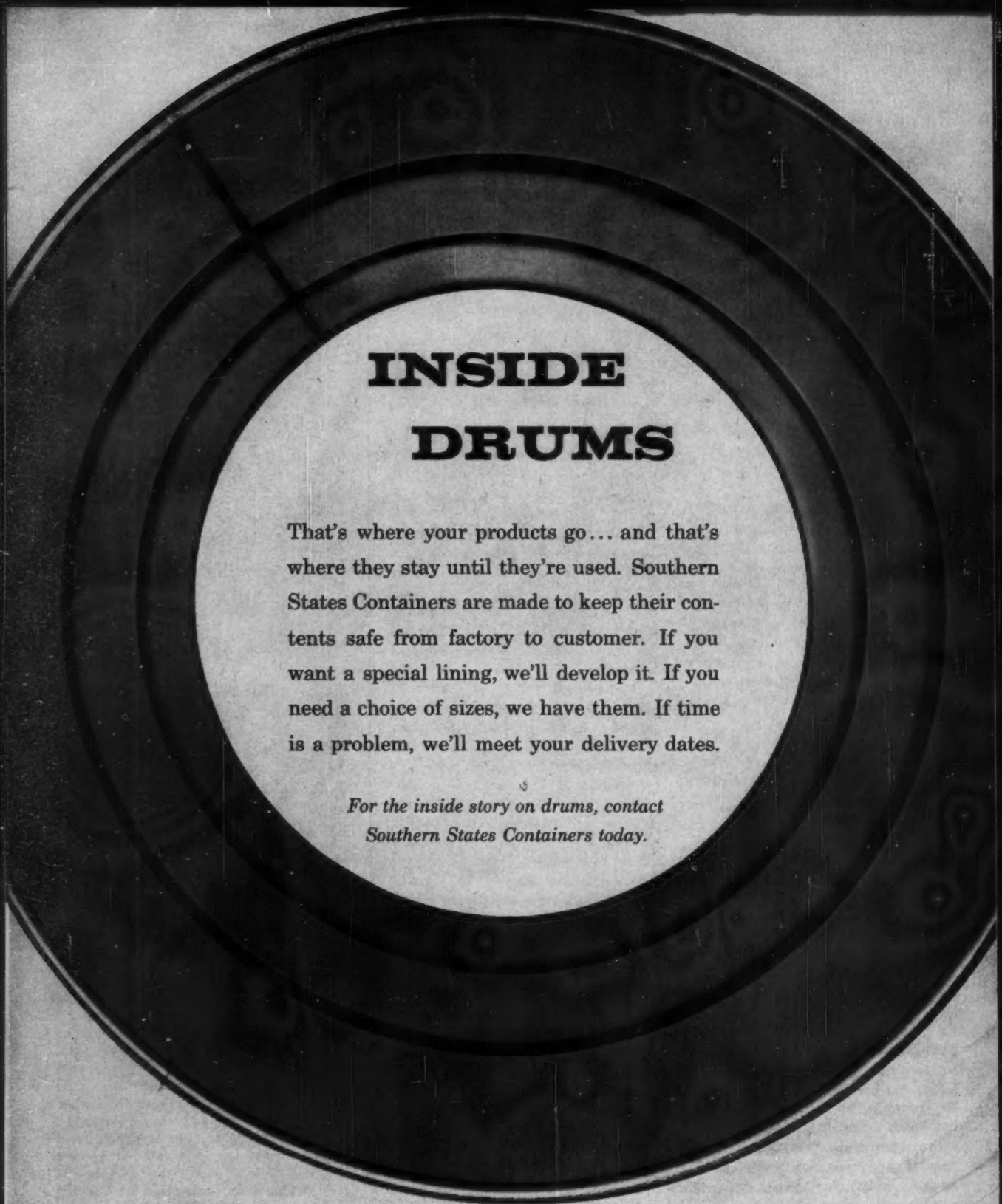

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Salesman Appraisal—Some Survey Highlights

- **All companies rate their salesmen but methods vary widely.**
- **Annual ratings are preferred by 3 out of 5 firms queried.**
- **Biggest problem: sizing up the "potential" of a territory.**
- **Current need: to make ratings more objective.**

Sizing Up Your Salesmen

Some revealing new facts are emerging this week on methods used by chemical companies to appraise the performance of their salesmen.

One of the latest evaluations, a study by Dow Chemical Co. salesman David Liebeskind, shows the diversity of methods now in use and the never-ending search for more-effective ones.

Liebeskind's study is based on numerous interviews with chemical sales managers and a mail-survey of 105 U.S. chemical producers (60 returns) having $10 million annual sales or more.

Among the highlights of his findings:

- All companies queried report they do evaluate their salesmen. Most chemical companies now review salesmen's performance annually. Over one-third of them, however, still appraise their staffers semi-annually.
- Evaluations vary from highly objective methods such as fixed formulas and checklists to completely subjective opinions from the salesmen's superiors.
- Most widely mentioned criteria for rating salesmen: sales volume (both by territory and by major accounts); efficiency at various tasks; company and industry knowledge and reporting; personal characteristics.
- Biggest problem: determining sales potential of a particular territory.

Sales management has strived for years to come up with more effective, fairer and quicker ways to spot top-flight sales staffers. Liebeskind's study sheds some light on the progress management has made.

Survey Findings: Reasons for sizing up chemical salesmen differ among major chemical producers, but generally these are the major ones:

- To learn how effectively the sales job is being done.
- To provide information on which to base plans to improve this effort.
- To monitor each man's progress for considering transfers, promotions, salary increases.
- To provide recognition for deserving salesmen.

Most field sales staffers are appraised by their line supervisors — usually by the field sales managers, but in some instances by district or regional sales managers, and often by the headquarters sales chiefs.

Over half (58%) of those firms responding to the mail survey say that they evaluate their men annually, while 37% appraise their staffers every six months. Some companies (5%) even size up their men monthly, although this effort is usually an

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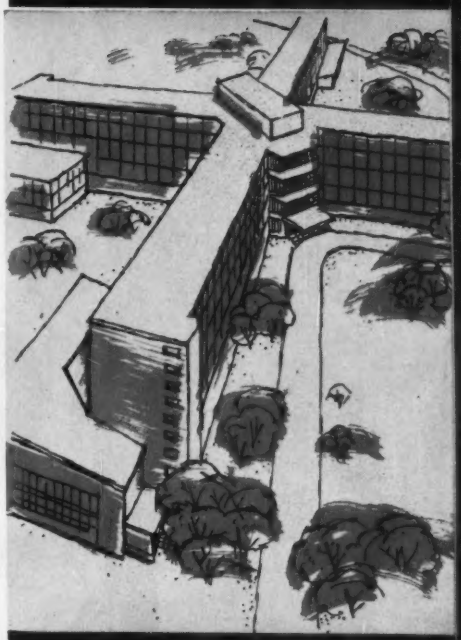

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If you place a high value on new chemicals with new uses, resulting from intensive scientific research—buy your chemicals from CARBIDE. Union Carbide Chemicals Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y.

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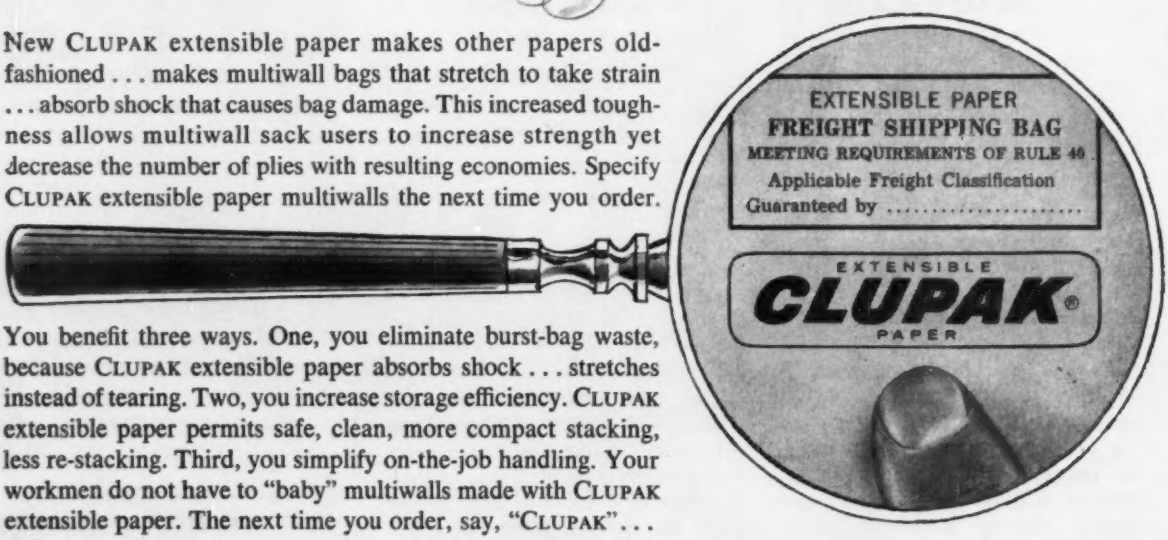
New CLUPAK extensible paper makes other papers old-fashioned . . . makes multiwall bags that stretch to take strain . . . absorb shock that causes bag damage. This increased toughness allows multiwall sack users to increase strength yet decrease the number of plies with resulting economies. Specify CLUPAK extensible paper multiwalls the next time you order.



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*Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N. Y. 36, N. Y.

Rating Salesmen: What Counts Most?

1. Sales volume vs. "potential"
2. Status of major accounts
3. Work methods
4. Personal qualities, knowledge.

abbreviated form of the semiannual evaluation.

Appraisal Methods: Most significant of the study results, however, is the portion dealing with methods used by chemical sales managers to assess the job done by their staff members.

A few firms admit that they use no formal evaluation procedures, simply administer "seat-of-the-pants" appraisals—almost completely the sales managers' opinions.

Most companies recognize the dangers inherent in this kind of appraisal, try to steer a course between a completely objective evaluation (which is impossible and probably also valueless) and a totally subjective one (which would be largely unsubstantiated).

For most companies, the answer to coming up with a sound appraisal is based on a combination of procedures that, taken together, might give them an accurate picture of how capably each salesman is representing the company to its customers.

Interviewing and counseling of a salesman by his immediate superior is probably the most common method used for exchanging ideas and information, permitting the superior to see first-hand how well the man is doing. In some cases, this is supplemented by joint visits to customers, so that the sales manager can see the man in action. Often, interviews are held with supervisors from one or two higher levels of management, or with company personnel, to insure a fair, objective appraisal. And many times the salesman gets a chance to evaluate himself—sometimes before his supervisor does, but more often afterward.

Another popular procedure is the use of some sort of rating scale. These generally list the work attributes (methods, habits, personal qualities) considered important by the company; they provide a scale by which the rater may pick an appropriate level of performance. These scales often cover work results such as sales volume and sales expense, usually include work methods, company knowledge and personal characteristics, may even cover social life, personal finances and family situation.

Opinion and bias, of course, can creep into this type of salesman rating; consequently, the rating directions exhort the supervisor to use his independent judgment, avoid remarks that can't be substantiated.

A few companies use complex formulas to rate their sales staffers. These sometimes take the form of equations in which a sales manager relates such variables as number of calls made, sales per call, expense per call, number of days worked. From this, he extracts a figure intended to convey some measure of a salesman's effectiveness. But industry reaction to this method is reflected by its infrequent use.

Regardless of the method used to size up chemical salesmen, most raters still rely on the same general criteria (*see chart, above*). Chief among them, of course, is "results," generally viewed as the salesmen's total territory sales volume, as well as the sales status of major accounts. (Profits and new accounts were mentioned by only three of 60 firms).

But measuring a salesman's worth by results raises a difficult question: How can management learn what is the "potential sales" of any or all of its products in a given sales territory? Factors such as reciprocal deals, high-level sales, and general economic

Compensating Chemical Salesmen

Straight salary	59%
Salary plus bonus	23%
Salary plus commission	6%
Other combinations	12%

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The synthetic organic chemicals you require in quantities for volume production can be obtained economically from CARBIDE. Tank car, tank truck, barge, or tanker orders are shipped from the CARBIDE plant or bulk station nearest you. Combination orders of two or more chemicals can be shipped in *compartment* tank cars or *compartment* tank trucks at substantial savings. You also save when you order several chemicals in drums to make a full car or truck load.

To receive your chemical shipments fast, taking full advantage of combination shipments, why not place your next order with us. Union Carbide Chemicals Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y.

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Atlanta 3 ..... Michael Miller, 1301 Rhodes-Haverty Bldg., JAckson 8-6951

Boston 16 ..... Paul F. McPherson, Copley Square, COngress 2-1160

Chicago 11 ..... Alfred D. Becker, Jr., R. J. Claussen, 520 N. Michigan Ave., MOhawk 4-5800

Cleveland 13 ..... H. J. Sweger, Duncan C. Stephens, 1164 Illuminating Bldg., 55 Public Square, SUperior 1-7000

Dallas 1 ..... Gordon Jones, John Grant, 901 Vaughan Bldg., 1712 Commerce St., Riverside 7-9721

Denver 2 ..... J. Patten, 1740 Broadway, ALpine 5-2981

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Los Angeles 17 ..... Robert Yocom, 1125 West Sixth St., HUntley 2-5450

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Pittsburgh 22 ..... Duncan C. Stephens, 4 Gateway Center, EXpress 1-1314

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St. Louis 8 ..... R. J. Claussen, 8615 Olive St., Continental Bldg., JEfferson 5-4867

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***For complete product data see catalog unit in the BUYERS' GUIDE ISSUE for 1960-61**

conditions are beyond the salesman's control, although they often influence his territory sales, sometimes to his detriment. No one has come up with a good answer to that question, simply because the salesman himself is nearly always the chief source of information on what that "potential" is.

Pegging Sales Performance: Effectively sizing up field sales staffers is one of the sales manager's knottiest tasks because industrial selling activities are so varied and complex. And many chemical sales managers feel that the difficulty of adequately judging the worth of each man in chemical selling operations is greater than that of most other industries.

Most chemical salesmen are called on to do so many different jobs (e.g., introduce new products, explain changes in specifications, "put out fires" when customers have difficulty, fight off tremendous competition, continually seek new uses and outlets) that sales management is faced with a real challenge in coming up with a fair appraisal of how effectively each sales staffer is functioning, how he can improve.

Although sales volume alone was once considered a valid indicator of a salesman's worth—and still is in some quarters—virtually none of the more successful chemical companies in the U.S. considers this factor alone. Reason: a salesman's success in winning and keeping business for the firm is very often dependent on efforts by other company personnel over which he has little control (advertising, traffic, credit, packaging, public relations, etc.).

Survey Sidelight: Liebeskind's results bear out the minor role of commissions as a form of chemical salesmen's compensation (*see chart, p. 85*). Over half (59%) of all firms polled say they pay their sales staffers a straight salary; another 23% pay salary plus bonus for top-notch work, and less than 18% report any use of commissions in paying their men.

Improving Methods: Doubtless, salesman appraisal techniques have been improved greatly in recent years. Still, the prevailing feeling among those responsible for performing this job—and quite likely among salesmen too—is that additional refinements and improvements are needed. Nearly one-third of all firms responding to the survey indicate that they have changes in the works now or are looking for better ways of evaluating their salesmen.

One big need, according to sales managers, is that of raising the level of objectivity of appraisals, reducing the bias and unfounded criticism that find their way into some performance reviews. Two methods: standardizing rating lists used by different raters; training supervisors to conduct appraisals uniformly.

Another improvement being sought by some chemical companies concerns making performance reviews more indicative of a man's actual selling effectiveness. One company is changing its "formula" in scaling to put less emphasis on the number of calls a salesman makes, more on the quality of his calls.

Outlook: Because of the great variety of methods and techniques used to assess performance of chemical salesmen, it's practically impossible to delineate an "ideal" or "most widely used" system. But this much is clear: most companies adopt those appraisal methods that reflect company goals. If these methods are to reveal the true picture of first-rate sales accomplishment, however, sales management must continue to develop more precise techniques.

DATA DIGEST

• **Equipment Rental:** New booklet outlines advantages of renting materials-handling equipment. Clark Rental Corp. (485 Lexington Ave., New York 17).

• **Tank Facilities:** Equipment and services bulletin gives information on tanks, tank renovations and specialized vessels for food, juice and chemicals processors, tank fabricators. The Bishopric Products Co. (4413 Este Ave., Cincinnati 32).

• **Company Products:** Non-technical booklet describes Frontier Chemical Co.'s products, processes of manfacture, quality-control methods. Other information covers the firm's sales and technical services, research facilities, manufacturing and distribution sites; packaging containers and sizes. Frontier Chemical Co., division of Vulcan Materials Co. (P. O. Box 545, Wichita 1, Kan.).

• **Slime Control:** New water-conditioning data sheet describes how to

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- Acrylates • Alcohols • Aldehydes
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- Ketones • Metallic Salts
- Monomers • Nitrogen Compounds
- FLEXOL Plasticizers • NIAX Polyethers
- CARBOWAX Polyethylene Glycols
- Polypropylene Glycols
- UCON Propellants and Refrigerants
- Special-Purpose Chemicals
- TERGITOL Surface Active Agents
- POLYOX Water-Soluble Resins

Nearly 400 synthetic chemicals of outstanding quality are offered by CARBIDE. Most are available in quantities for high-volume production—and prices are competitive. For a more complete listing, mail the coupon to Dept. J, Union Carbide Chemicals Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y.

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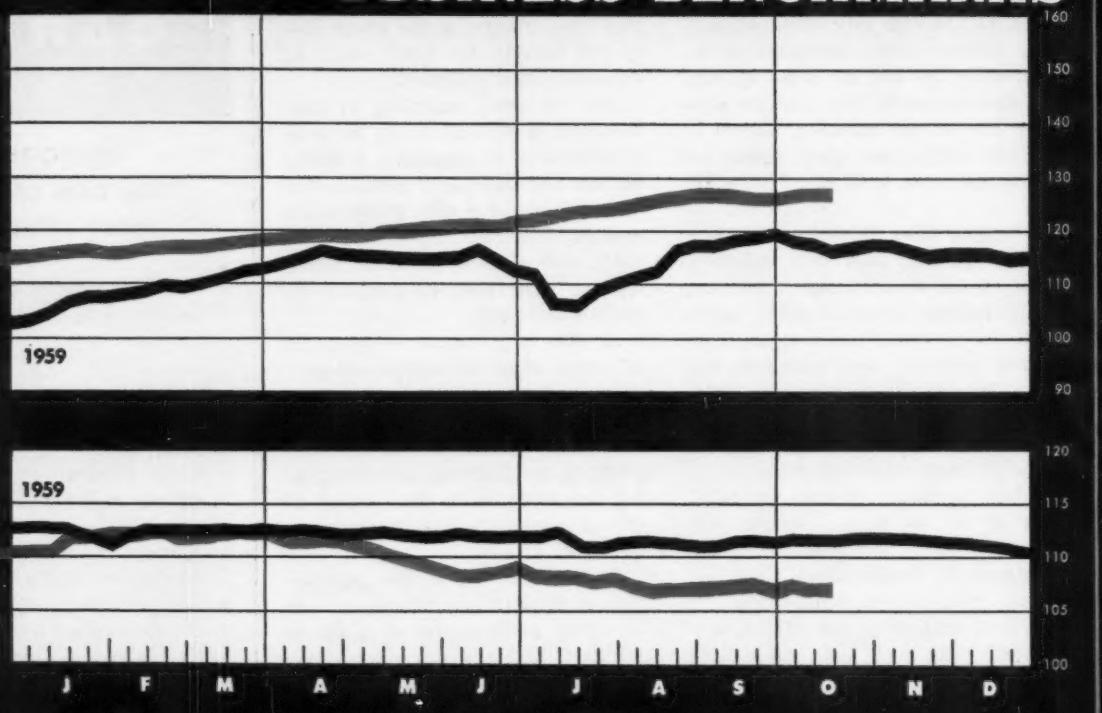
BUSINESS BENCHMARKS



OCTOBER 1, 1960

WEEKLY BUSINESS INDICATORS	*Latest Week*	*Preceding Week*	*Year Ago*
Chemical Week output index (1957=100)	125.2	125.0	120.3
Chemical Week wholesale price index (1947=100)	106.9	106.3	110.9
Stock price index (12 firms, Standard & Poor's)	46.23	47.06	55.18
Steel ingot output (thousand tons)	1,537	1,510	362
Electric power (million kilowatt-hours)	13,903	14,216	12,779
Crude oil and condensate (daily av., thousand bbls.)	6,847	6,874	6,810

FOREIGN TRADE INDICATORS (thousand dollars)	EXPORTS *Latest Month*	EXPORTS *Preceding Month*	EXPORTS *Year Ago*	IMPORTS *Latest Month*	IMPORTS *Preceding Month*	IMPORTS *Year Ago*
Chemicals, total	145.3	142.5	122.9	23.9	33.3	28.3
Coal-tar products	15.7	11.9	7.8	5.7	6.7	2.6
Industrial chemicals	25.2	25.9	19.3	8.0	9.6	8.8
Medicinals and pharmaceuticals	23.9	24.8	26.1	2.0	2.4	1.5
Fertilizers and materials	10.3	9.4	8.8	6.1	11.6	8.7
Vegetable oils and fat (inedible)	7.6	12.1	14.2	7.1	6.5	6.6

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increase life of open cooling towers by slime control with chlorine and nonoxidizing biocides. Betz Laboratories, Inc. (Gillingham & Worth Sts., Philadelphia 24).

• **Rare Earths:** New technical-data sheets detail catalytic properties of rare-earth elements and compounds. Vitro Chemical Co. (342 Madison Ave., New York 17).

• **Laminating Plastics:** Latest edition of "Formica Designer's Fact Book" has 115 pages of property and application data covering 70 standard, special and molding grades of high-pressure thermosetting laminating plastics. Book lists military specifications, fabricating facilities, thickness and weight guides. Formica Corp. (4550 Spring Grove Ave., Cincinnati).

• **More Plastics:** Revised brochure describes high-density polyethylene resins (No. 15—pipe extrusion); high-density ethylene copolymers (No. 26—copolymers). Plastics Seals Division, Phillips Chemical Co. (Bartlesville, Okla.).

• **Pipe Insulation:** New specifications booklet (Form 6472) describes calcium silicate pipe and block insulation for temperatures up to 1350 F. Tables list dimensional stability and resiliency, efficiency, flame and water resistance. Philip Carey Mfg. Co. (320 South Wayne Ave., Cincinnati 15).

• **Toxicological Reviews:** Two recent reviews outline the toxicological properties and suitable precautions for benzene, toluene and xylene, and for copper naphthenate, naphthalene, naphthenic acids and butadiene Cost: 25¢/copy. The American Petroleum Institute (1271 Ave. of Americas, New York 20, N.Y.).

• **Special-Purpose Paints:** Two data sheets describe heat resistant and bright silver finish paints (No. 5) and heavy film build paints (No. 6). These latter materials are used to deposit thicker-than-normal coatings with one paint application. Subox, Inc. (Hackensack, N.J.).

• **Leather Chemicals:** Booklet (No. 510) outlines methods of treating hides and skins using sodium sulfhydrate, sodium sulfide and sodium tetrasulfide solution. Also included: properties and uses of numerous other chemicals for leather treating and finishing. Hooker Chemical Corp. (Niagara Falls, N.Y.).

Tracers

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POSITIONS VACANT

Operating Manager Wanted. Evaporated salt plant in south wants experienced superintendent to manage operation. Work record required to show ability to manage plant and handle people. Opportunity for right Person. P-5215, Chemical Week.

Chemical Commercial Development-Market Research—Opportunity for a product oriented chemist or chemical engineer with broad knowledge of the chemical industry is open. Experience in Commercial Development desirable but not necessary. Knowledge of polymer technology would be beneficial. Reply directly to: Manager, Personnel Relations, The Richardson Company, 27th Avenue & Lake Street, Melrose Park, Illinois.

Chemist—Well established chemical company with growth plans has immediate opening for a chemist with background experience in wax and silicone emulsifications. Salary open. P-5348, Chemical Week.

Market Research Analyst—Project Director Large diversified manufacturer chemical, food, agricultural fields, Assist Market Research Manager in projects involving marketing problems and sales analysis. Minimum supervision. Prefer MBA market research major, undergraduate chemistry and/or statistics preferred. Age range 28—35. $8,000—$9,000. Send complete resume for confidential consideration to: Employment Manager, Archer-Daniels-Midland Company, 700 Investors Building, Minneapolis 2, Minnesota.

SELLING OPPORTUNITIES AVAILABLE

Manufacturer of surface active agent requires sales representation by established agency. New line with manufacturer, so agencies are open in all sections of country. Products and consumer interest are established. RW-5324, Chemical Week.

Salesman: Industrial Chemicals; Must be thoroughly familiar with marketing heavy organic and inorganic acids; organic solvents; plasticizers and intermediates. Experienced individual can earn substantial five figure income including liberal salary, profit sharing and other benefits with progressive, rapidly expanding distributor and manufacturer. Mercury Chemical Corp., Edison, N. J., Liberty 8-1540.

If you are a manufacturer seeking new or added sales outlets—or if you are a manufacturer's agent or chemicals distributor with the capacity, time and energy to take on additional lines—make your interests known in this column of Chemical Week. The right agent or jobber teamed up with the saleswise manufacturer makes the right combination for the hard selling days ahead. There's profit for both, which can be initiated through low-cost classified advertising. Write Employment Opportunities, Chemical Week. P.O. Box 12, New York 36, N.Y.

POSITIONS WANTED

Sales Consultant available. Technical, sales experience with resins, pigments, solvents, chemicals to the paint, varnish, lacquer, alkyd industries, PW-5173, Chemical Week.

Notice Heavy Chemical Distributors: Young man experienced in bulk storage of solvents, acids, also traffic management. Would like relocation in southeast. PW-5363, Chemical Week.

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Tubes Filled 7cc to 3 Oz. Any Material—1,000 to 50,000 quantity. John Schirer Inc. 165 Portland Ave., Rochester, New York.

Colombia S.A.—Chemical manufacturer, desires to contact U.S. manufacturers of chemical specialties interested in the Colombian market. Manufacturing facilities and a nation-wide sales organization available. Products might be sold under your own trade-marks if desired. Excellent references. CWW-5350, Chemical Week.

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Chemical Specialties—We are interested in acquiring substantial interest in small progressive company manufacturing trademarked products with export potential. Prefer within 50 miles Manhattan. Replies confidential prompt action. BO-5351, Chemical Week.

Experienced technical executive with capital desires to meet ambitious chemist or chemical engineer with imagination and products ideas. Objective to form a manufacturing chemical company on mutual participation basis. BO-5375, Chemical Week.

PROFESSIONAL SERVICES

Technical Guidance by Martin H. Gurley, Jr., Research Advisory Service, RFD. 4 Lexington, Va. COngress 1-3294.

FOR SALE

Fillmaster—Semi & Fully Automatic package filling machines. $800.00 up. Stuvesant Engineering Corp. Norwood, New Jersey.

Liquidation, $8,000,000 Alcohol Plant at Omaha, Nebraska. Dryers, Filters, Stills Evaporators, Exchangers, Tanks, Pumps, etc. Send for circular. Perry, 1415 N. Sixth St., Phila. 22, Pa.

Vulcan 10'x11' dia.x 175' long rotary kiln ¾" shell 2 tires firing hood etc. Very attractive price. Perry, 1415 N. Sixth St., Phila. 22, Pa.

T316 s.s. distillation column 96" dia. x 37" high. 30 bubble cap. trays. Like new. Perry, 1415 N. Sixth St., Phila. 22, Pa.

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CHEMICALS FOR SALE

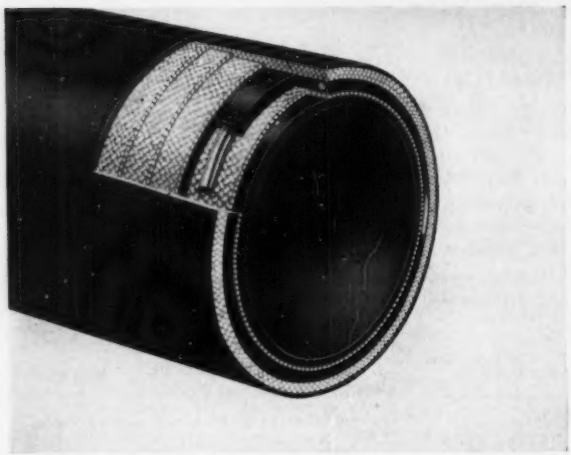
60 Lypks. Aluminum Stearate 32¢ lb. Bulk DOS Plast. 32¢/lb. (dark). Bulk DBS Plast. 33¢/lb. w/w. Bulk Acetone Redistilled 43¢/gal. Monochlorobenzene, Bulk, 25000# 7¢/lb. Orthodichloro Benzene, Drs, 4000# 10¢/lb. FS-5275, Chemical Week.

CHEMICALS WANTED

Surplus Wanted—Chemicals, Pharmaceuticals, Oils, Acids, Plasticizers, Resins, Dyes, Solvents, Pigments, Etc. Chemical Service Corporation, 96-02 Beaver Street, New York 5, N. Y. HAnover 2-6970.

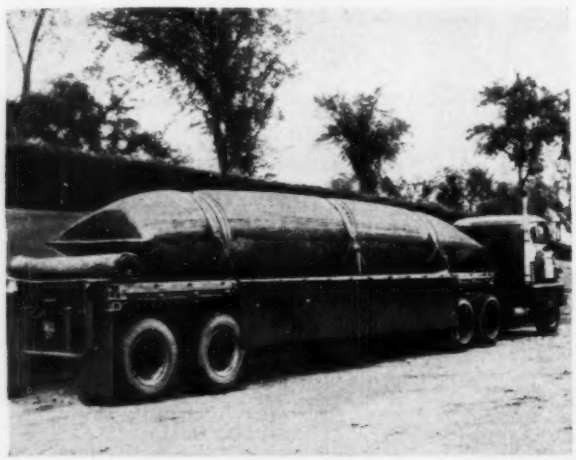
MISCELLANEOUS

To Employers Who Advertise for Men: The letters you receive in answer to your advertisements are submitted by each of the applicants with the hope of securing the position offered. When there are many applicants it frequently happens that the only letters acknowledged are those of promising candidates. (Others do not receive the slightest indication that their letters have even been received, much less given any consideration.) These men often become discouraged, will not respond to future advertisements and sometimes even question if they are bona fide. We can guarantee that Every Advertisement Printed Is Duly Authorized. Now won't you help keep our readers interested in this advertising by acknowledging every application received, even if you only return the letters of unsuccessful applicants to them marked say, "Position filled, thank you." If you don't care to reveal your identity, mail them in plain envelopes. We suggest this in a spirit of helpful co-operation between employers and the men replying to Positions Vacant advertisements. Classified Advertising Division, McGraw-Hill Publishing Company. "Put Yourself in the Place of the Other Fellow."



IN ACID-PROOF HOSE. The Butyl jacket and liner of this hose offer high resistance to most acids, chemicals, abrasion and weathering.

IN WORK RUBBERS. Thanks to Butyl, these rubbers are resistant to chemicals, moisture, abrasion . . . and slipping.



IN COLLAPSIBLE TANKS. These units of Butyl which resist many chemicals, abrasion and weathering, convert flat-bed trailers into large capacity liquid carriers in just minutes.

YOU GET EXPERT TECHNICAL ASSISTANCE. The Enjay staff of Butyl experts – backed by the resources and knowledge of one of the world's great research laboratories – are always ready to serve you.

ENJAY BUTYL...VERSATILE POLYMER

ENJAY® BUTYL

In many applications, Enjay Butyl outperforms all other polymers and elastomers known to the chemical industry.

Butyl is the preferred rubber for countless types of hoses, tank linings, gaskets, seals – and many other applications where exacting chemical resistance is required.

Other features of Butyl rubber –such as its resistance to tear and abrasion, sunlight and weathering, as well as the damping, electrical and dielectric properties – are responsible for the selection of Butyl rubber in many varied applications.

Typical of these is the proved success of the all-Butyl passenger tire where Enjay Butyl rubber provides such features as no-screech on turns and fast stops

FOR TACKLING TOUGH JOBS!

– added traction and stopping power and quieter ride with maximum shock absorption.

Butyl is the "idea" rubber with uses stretching as far as the imagination can reach. We'll be glad to tell you all about it. Just contact the nearest Enjay office. *Home Office:* 15 West 51st Street, New York 19, N. Y. *Other Offices:* Akron • Boston • Charlotte Chicago • Houston • Los Angeles New Orleans • Plainfield, N. J. Southfield, Mich. • Tulsa

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SD-designed plants now account for over 1/3 of world's ethylene oxide direct oxidation capacity

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Second Project
Gonfreville, France

SOCIETE CHIMIQUE DES DERIVES DU PETROLE EXPANSION
Second Project
Antwerp, Belgium

NEW EUROPEAN PLANT
(To be announced later)

NEW ETHYLENE OXIDE PLANTS ON STREAM

NAPHTACHIMIE EXPANSION
Fourth Project
Lavera, France

ERDOELCHEMIE G.m.b.H. EXPANSION—*Second Project*
Dormagen, Germany

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Yokkaichi, Japan

NAPHTACHIMIE
Lavera, France

SOCIETE CHIMIQUE DES DERIVES DU PETROLE
Antwerp, Belgium

ERDOELCHEMIE G.m.b.H.
Dormagen, Germany

ALLIED CHEMICAL CORPORATION
Nitrogen Div., Orange, Texas

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